Securities Class Actions as Disciplinary Mechanisms: Debt Financing, Political Lobbying and Innovation

by

Matthew McCarten

A thesis submitted in partial fulfilment of the requirements for the degree of Doctor of Philosophy in Finance

Department of Accountancy and Finance
Otago Business School
University of Otago, Dunedin
New Zealand

June 2017

Abstract

This thesis examines the role of securities class actions (SCAs) in corporate governance. Three empirical chapters are presented examining the relationship SCAs have with debt financing, lobbying and firm innovation.

Chapter 2 examines the impact SCAs have on a firm's debt financing and lending relationships, with particular focus on the lender's reputation and a firm's *ex-ante* relationship with its lenders. The results indicate that reputable lenders are better screeners and as a result are less likely to lend to high litigation risk firms. Turning to *ex-ante* relationships with lenders, the evidence indicates that firm's that did not have a relationship with a lender are less likely to be able to develop one post-filing. On the other hand, if a firm had an established relationship with a lender before the filing, they are more likely to continue borrowing from that lender. Furthermore, for firms that had an existing relationship with a lender, loans initiated after the filing are larger in size and have smaller spreads relative to those firms without a relationship. Overall, it appears that corporate misconduct does not undermine a firm's relationship with its providers of financial capital.

Chapter 3 examines the impact of lobbying on the time it takes to detect managerial misconduct and the size of penalties associated with SCAs. Managers of lobbying firms are able to get away with misconduct for longer and are marginally less likely to have to settle a class action up to 2004. From 2005 onwards, lobbying no longer impacts the time it takes to detect misconduct or the outcome of the case. It is argued that regulatory action (the Sarbanes Oxley Act) has had the desirable effect of reducing the tacit power of lobbying firms.

Finally, Chapter 4 examines the relationship between SCAs and firm innovation. The evidence indicates that innovative firms are relatively more likely to be sued. This chapter presents evidence that innovation may increase the opportunities and pressures to commit misconduct. Furthermore, investment in innovation immediately declines post-filing resulting in a decline in the quantity of patents. However, the filing has no impact on innovative quality or efficiency.

Acknowledgements

First and foremost, I would like to thank my supervisors Associate Professor Ivan Diaz-Rainey, Dr. Helen Roberts and Dr. Eric Tan for their guidance, patience and support. I'm grateful for all that you have done for me. Without your supervision and encouragement this thesis would not have been possible.

I am grateful for the helpful comments received during conference presentations at: the 29th Australian Finance and Banking Conference (Sydney, 2015), and the 20th and 21st New Zealand Finance Colloquiums (Queenstown, 2016; Auckland 2017). Also I would like to thank seminar participants at the University of Otago (2015, 2016 and 2017), Macquarie University (2015), University of Technology Sydney (2015), UC Davis (2016), Boston University (2016), NYU (2016), University of New Hampshire (2016) and University of Canterbury (2016). Furthermore, I would like to extend a special thank you to Prof. David Lont, Prof. Sue Wright, Prof. Andrew Ferguson, Prof. Paul Griffin, Prof. Estelle Sun, Prof. Joshua Lerner and Prof. Ahmad Etebari for facilitating the organisation of seminar presentations and for all the helpful advice. I also want to thank Prof. Frank Yu for help related to datasets.

I would also like to express my gratitude to Prof. Paul Healy for providing me with the opportunity to visit Harvard University and for all the invaluable guidance he provided. I would also like to thank Prof. John Beshears and Prof. Gwen Yu for allowing me to audit their courses at Harvard, even though I was only there for a short time I learnt a lot. I am also grateful for the financial support provided by Shayne Elliott of ANZ Bank and the Department of Accountancy and Finance at the University of Otago.

Finally, I want to thank my friends and family for all the support they have provided over the years.

Table of Contents

List of Tables

List of Figures

Chapter 1

Introduction

1.1 Overview

Securities class actions (SCAs) have become increasingly prevalent over the last two decades.[1] Traditionally, most SCAs have occurred in the US, however, shareholder litigation is becoming more frequent in other countries and some countries are currently debating the adoption of a legal framework for class actions.[2] Despite the increasing frequency, there is still debate over the costs and benefits of SCAs. SCAs are one of the few private forms of recourse investors have against a firm's managers (Gillan, 2006). However, the effectiveness of SCAs as an *ex-post* method of disciplining a firm's managers has yet to be fully determined. This thesis contributes to the understanding of the efficacy of SCAs in corporate governance, by examining their determinants and consequences.

To explore the efficacy of SCAs as a disciplinary mechanism, three empirical studies are undertaken in this thesis. These studies employ a comprehensive dataset of SCAs filed in the US. The first study (Chapter 2) investigates the association between corporate lending and the filing of a SCA. Specifically, this chapter examines whether *reputable* lenders are better at screening and monitoring litigation risk. Furthermore, this study also

[1] In 2016 there were a total of 270 new SCAs filed in the US, which is significantly higher than the historical average between 1997 and 2015 of 188 filings (Cornerstone Research, 2017a).
[2] SCAs are becoming more frequent in countries such as Canada and Australia. Whereas, New Zealand and Switzerland are currently debating whether to establish a legal framework for class actions (see Baumgartner, 2009; Wicks, 2015; Hensler, 2016).

examines whether the filing of a SCA impacts a firm's *relationship* with its lenders and the terms it receives on new loans. The relationship between political lobbying and SCAs is examined in Chapter 3. This chapter investigates whether a firm's tacit power, signalled by its lobbying, is associated with the time it takes to detect corporate misconduct before and after the enactment of SOX. The final empirical chapter (Chapter 4) examines the association between corporate innovation and SCAs. This study analyses whether innovative activities influence the probability of shareholder litigation occurring and if corporate innovation is impacted by the filing of a SCA.

Through these different studies, this thesis provides a better understanding of the determinants and consequences of SCAs. The findings reported, therefore, provide greater insight into the cost/benefit trade-off associated with SCAs.

1.2 Background on Securities Class Actions

A SCA is a lawsuit filed by a group of investors against a firm's mangers alleging losses caused by the violation of securities laws. Allegations often relate to some form of managerial misconduct. Typical accusations include: accounting irregularities (e.g. improper revenue recognition or understatement of liabilities or expenses), false or misleading disclosures and regulatory violations. SCAs have traditionally been most common in the US however, they are occurring more frequently in other countries. Canada and Australia, in particular, are becoming more attractive places for shareholder litigation (Monestier, 2011; Issacharoff and Eagles, 2015). Furthermore, other countries (including New Zealand and Switzerland) are debating whether to adopt formal class action procedures (see Baumgartner, 2009; Wicks, 2015; Hensler, 2016). However, the efficacy of class actions is still being debated in the literature (e.g. Dam, 1975; Choi, 2004; Mullenix, 2014).

There are several key benefits and drawbacks associated with SCAs. The most noteworthy benefit is that SCAs are an efficient way to deal with a large number of claims. In a SCA a single entity can act on behalf of others' in a similar position allowing the resolution of a large number of claims in a single action. By combining the individual claims into a single action the case can be dealt with in a timelier and more cost efficient manner than if all the individual entities in the class were to file independent cases (Dam, 1975).

The aggregation of claims also provides a form of recourse for individuals who suffer relatively small losses. The cost of litigation for these individual claimants would most likely exceed the losses sustained. By combining all the individual claims, a SCA can achieve economies of scale. This efficiency provides a viable manner for smaller claimants to gain access to justice (Murphy and Cameron, 2006).

SCAs could also serve a role as a deterrence mechanism. The threat of a class action and the costs stemming from litigation may serve to modify management's behaviour, thereby limiting the occurrence of corporate misconduct in the first place. However, the frequency of filings in 2016 is the highest it has been since the dot-com bubble (Cornerstone Research, 2017a; NERA, 2017). This suggests that SCAs likely only play a limited role in deterring misconduct. Furthermore, SCAs can also be a way of imposing discipline on managers even after the occurrence of misconduct. The reputational and financial penalties imposed on managers can serve as a method of disciplining managers, thereby reducing agency issues (Becht et al., 2003).

A major drawback of SCAs is the filing of frivolous cases. Frivolous SCAs typically occur when shareholders attempt to opportunistically recover losses on their investments. Frivolous cases, as opposed to meritorious cases, are unrelated to the violation of securities laws. The Private Securities Litigation Reform Act of 1995 (PSLRA) was enacted to limit the incidence of frivolous cases. Despite the PSLRA resulting in fewer non-nuisance claims (Johnson et al., 2007; Choi et al., 2009) it is becoming more common for cases to be dismissed (NERA, 2017).[3] This suggests that frivolous cases are still a major issue in the US system. These nuisance cases merely serve as a distraction to managers and are typically targeted at large firms with "deep pockets" who are likely to pay a settlement to avoid the cost associated with litigation.

Further, since, Directors' and Officers' (D&O) insurance typically covers settlement pay-outs wrongdoers often face limited direct financial culpability. Coffee (2006) argues that settlements typically just result in the transfer of losses from one group of shareholders to another. Coffee further contends that since these penalties are not always imposed on the culpable parties, SCAs likely only provide limited deterrence.

[3] NERA (2017) report that of the US cases that were resolved in 2016 over half of them were dismissed (113 settled vs 149 dismissed) compared to 1996 when the majority of cases were settled (149 settled vs 43 dismissed).

Another drawback of SCAs is the conflict of interest that exists between lawyers and the investor class. The suing class's primary goal is to maximise the losses recovered. Whereas, the class counsel's main interest is in maximising the fees obtained. These two interests will not always align.[4] Furthermore, in some cases the settlement is only enough to cover the lawyer's fees and the plaintiff class do not recover any of their losses (Romano, 1991). From the existing literature, it is unclear whether the benefits of SCAs outweigh the costs.

There has also been much debate as to the relative importance of both private and public forms of enforcement for financial markets (e.g. La Porta et al., 2006; Djankov et al., 2008; Jackson and Roe, 2009; Welsh and Morabito, 2014). As such, the importance of a private form of legal recourse, such as SCAs, is not fully understood. This thesis extends the current literature by examining the determinants and consequences of SCAs in a corporate governance framework. This study, therefore, contributes to the ongoing debate about the efficacy of SCAs as a disciplinary mechanism.

1.3 Prior Research on SCAs

Prior research, in the finance literature, on SCAs can be broken into two separate types of studies. The first type examines the determinants or causes of shareholder litigation and the second type investigates the consequences of SCAs. [5]

1.3.1 Determinants of Litigation Risk

Numerous studies have used predictive models to assess a firm's litigation risk. These models are not only useful in assessing the *ex-ante* litigation risk of firms but can also provide an *ex-post* understanding of why firms are sued. These studies have found that shareholder litigation frequently occurs in biotech, computers, electronics and retail based industries. Sued firms are also typically larger in size, have a larger proportion of intangible assets, are more likely to be overinvesting, have poorer stock performance, and

[4] Lawyer's fees are based on the outcome of the case, so losing a case at trial could result in the loss of a substantial amount of fees for the lawyers. The class counsel, therefore, has an incentive to settle rather than risk possibly losing a trial. However, a settlement will not always be in the best interest of the shareholders involved in the class action. As a result, the shareholder class may not always receive appropriate compensation relative to the amount of damage that was done.

[5] See Arena and Ferris (2017) for a survey of the literature on SCAs.

have higher stock volatility and turnover during the period of alleged misconduct (Jones and Weingram, 1996; Strahan, 1998; Gande and Lewis, 2009; McTier and Wald, 2011). Firms are also more likely to have a SCA filed against them if executives are compensated with more option or stock grants (Bauer et al., 2008; Peng and Roell, 2008; Jones and Wu, 2010).

However, no research so far has examined litigation risk with respect to the reputation of a firm's lenders or corporate innovative activities. Whether the reputation of a firm's lender and its innovative activities explain the occurrence of SCAs is examined in Chapter 2 and Chapter 4 respectively. This thesis, therefore, contributes to the literature by providing a better understanding of *ex-ante* litigation risk. Even though not all SCAs are meritorious in nature a better understanding of litigation risk will also be useful for the detection and prevention of future corporate misconduct.

Relatively few studies have examined the underlying mechanisms involved in the detection of managerial malfeasance. Dyck et al. (2010) examine the various economic agents that are associated with the detection of fraud. Similarly, Yu and Yu (2011) investigate the time it takes to detect fraud and find that lobbying firms are more likely to get away with it for longer. Chapter 3 extends the findings of Yu and Yu by examining whether lobbying firms are able to get away with misconduct after the enactment of the Sarbanes-Oxley Act (SOX). As such, this chapter provides valuable insight into the factors that could influence the detection of misconduct.

1.3.2 Consequences of SCAs

The consequences and changes firms make after the filing of a SCA are useful in determining the effectiveness of SCAs as a disciplinary mechanism. One notable consequence of shareholder litigation is the direct costs that they can impose on firms. These direct costs come in the form of settlement disbursements. The average settlement size was approximately $56 million between 1996 and 2015, and the total amount of settlements approved by courts was nearly $6 billion dollars in 2016 (Cornerstone Research, 2017b). Although, these settlements are typically covered by D&O insurance, the direct financial penalties can be substantial.[6]

[6] The ten largest settlements all exceed $1 billion.

Prior research indicates that settlements are related to, the severity of the case as well as the losses sustained by investors (Cox et al., 2004; Karpoff et al., 2008a). Furthermore, if an institutional owner is the lead plaintiff, settlements are on average larger (Cheng et al., 2010). However, no research has examined whether a firm's political influence is associated with the outcome of a SCA. Chapter 3 addresses this issue by investigating whether the probability of a case being settled or the size of a settlement is related to a firm's lobbying activities. The results from this chapter provide a greater understanding of what influences the direct financial consequences of shareholder litigation.

SCAs not only impose direct financial penalties but can also indirectly damage the reputation of firms. Karpoff et al. (2008a) report that the reputational loss imposed on firms prosecuted for financial misrepresentation is 7.5 times greater than the direct legal penalties. The cost or penalties imposed by SCAs are associated with its effectiveness at deterring misconduct and disciplining managers that violate securities laws. Understanding indirect costs of shareholder litigation, therefore, provides greater insight into the effectiveness of class actions as a disciplinary mechanism.

The filing of a SCA can create significant uncertainty and adversely damage a firm's credibility with its customers, suppliers and providers of financial capital. Consistent with this, numerous studies have found a significant negative market reaction to the filing of a class action (see Karpoff and Lott, 1993; Bhagat et al., 1994; Griffin et al., 2004; Gande and Lewis, 2009; Bauer and Braun, 2010). Furthermore, sued firms also face a higher cost of equity (Chava et al., 2010) and are charged higher spreads on new loans (Deng et al., 2014; Yuan and Zhang, 2015). Chapter 2 extends the current understanding of reputational penalties faced by firms seeking debt financing, following the filing of a SCA, by accounting for the *ex-ante* relationship with its lender. This chapter, therefore, extends the current understanding of reputational penalties that are imposed on firms after the filing of a SCA.

Shareholder litigation can also result in improvements in internal governance mechanisms. Following the filing of a class action, the likelihood of managerial turnover is higher and the probability of turnover is related to the merits of the case (Romano, 1991; Niehaus and Roth, 1999; Humphery-Jenner, 2012). Board structure is also more likely to improve following litigation or the discovery of fraud, as a result of an improvement in the percentage of outsiders and a separation of the roles of CEO and Chairman of the Board of Directors (Marciukaityte et al., 2006; Ferris et al., 2007; Cheng et al., 2010).

Investing activities are also impacted by the filing of a class action. Capital expenditures and R&D expenditures decline proceeding the filing of a class action (Autore et al., 2014; Yuan and Zhang, 2014; Arena and Julio, 2015). Despite this evidence of a change in investment, no study so far has examined whether a firm's innovation is affected by the filing of a SCA. Chapter 4 fills this gap in the literature by examining the short- and long-term impact the filing of a SCA has on corporate innovative activities. Therefore, this chapter contributes to the understanding of the consequences of SCAs and provides insight as to whether they improve managerial discipline.

By examining the direct penalties of a SCA (Chapter 3), as well as the penalties imposed by lenders on sued firms (Chapter 2) and the changes in innovation (Chapter 4), this thesis extends the existing literature and provides a better understanding of the costs and benefits associated with shareholder litigation. As such, this thesis provides further insight into the usefulness of SCAs as a disciplinary mechanism.

1.4 Research Objectives and Contributions

The three empirical chapters investigate the association between SCAs and various important corporate characteristics, including debt financing (Chapter 2), political lobbying (Chapter 3) and innovation (Chapter 4). Each of these chapters provides several important contributions regarding the determinants and consequences of SCAs. The empirical chapters examine SCAs that are filed in the US, which have been obtained from the Stanford Securities Class Action Clearinghouse (SCAC).[7] Each study augments this SCA information with data obtained from various sources. In Chapter 2, a sample of loans obtained from Dealscan is analysed. Chapter 3 investigates political connections as measured by the amount of money firms spend on lobbying. Lobbying data for this chapter was obtained from the Centre for Responsive Politics (CRP).[8] Finally, innovation as proxied by R&D expenditures and patenting activities, is examined in Chapter 4. Firm patenting information was obtained from a dataset compiled by Kogan et al. (2017).[9]

The focus of this thesis is on the accusation of managerial misconduct, however, all of the analysis undertaken is at the firm-level. This setup for the analyses has been used in

[7] http://securities.stanford.edu/
[8] https://www.opensecrets.org/
[9] https://iu.app.box.com/v/patents

each of the empirical papers since the filing of a class action is filed against a firm. Although individuals are named in the class action the majority of the liability falls to the firm. As such, it is appropriate to look at firm level changes in this context even though the commission of the alleged illegal activity is being undertaken by individuals within those firms.

As previously mentioned, Chapter 2 examines the association between corporate lending and SCAs. This chapter contributes to the literature by examining whether *reputable* and *relationship* lenders are associated with corporate misconduct. Specifically, the following three key research questions are examined: (1) Are firms that borrow from *reputable* lenders less likely to be subject to a SCA? (2) Are firms more likely to continue a *relationship* with a lender after the filing of a SCA? (3) Do firms with an existing *relationship* with a lender receive more favourable terms on new loans than sued firms without a relationship after the filing of a SCA?

Chapter 2 makes three major contributions to the existing literature on SCAs and corporate loans. First, this is the first empirical work to examine whether *reputable* lenders are more adept at avoiding or limiting the incidence of shareholder litigation. Second, this is the first empirical work to examine how a firm's *relationship* with its lenders is impacted by the filing of a SCA. Finally, this paper extends the current understanding of reputational penalties imposed on new loans by explicitly accounting for firms' *ex-ante* lending relationships.

The main findings from Chapter 2 include the following. Firms are less likely to face a SCA if they borrow from a *reputable* lender, which appears to be a result of reputable lenders screening out prospective borrowers with a high risk of litigation. Sued firms are also less likely to be able to develop a *relationship* with a lender after the filing of a class action, if they did not already have one. Furthermore, if a firm did not have a relationship with a lender pre–filing, loans initiated after being sued are more likely to exhibit larger spreads and be shorter in maturity. However, firms with an existing lender relationship are more likely to continue to borrow from the same lender after the filing. Sued firms with an *ex-ante* relationship with a lender receive more favourable loan terms than sued firms without a relationship. These benefits include relatively smaller spreads and better access to more capital. Overall, these findings indicate that banks with an established lending relationship may be willing to provide more lenient loan terms to ensure a continuing

relationship with a firm. As a result, reputational penalties on new loans faced by sued firms can largely be offset by developing a lending relationship.

Chapter 3 analyses the relationship between political lobbying and SCAs. This chapter investigates whether a firm's tacit power signalled by its lobbying activities is associated with the time it takes to detect corporate misconduct before and after the enactment of SOX. The following three research questions are analysed in this chapter: (1) Are firms that lobby able to get away with their misconduct for longer? (2) Are firms that lobby more likely to settle a SCA? (3) Do lobbying firms that are sued cause more damage and face greater reputational penalties?

This study makes several contributions to the existing literature. First, it extends the work conducted by Yu and Yu (2011) and shows that although lobbying firms are able to get away with their misconduct for longer prior to 2004 they are not able to afterward. Second, it examines the impact of political connections on the probability of settlement and the size of the settlement. As such, it provides a greater understanding of the drivers of the direct costs of shareholder litigation. Finally, this study provides insight into the effect that SOX has had on the detection of corporate misconduct.

A summary of the main results of Chapter 3 are as follows. Up to 2004, lobbying firms exhibit longer class periods and are marginally less likely to settle a class action. It is argued that this longer detection time is most likely a result of economic agents being unwilling to speak out against lobbying firms, for fear of the repercussions. However, after 2005, lobbying is unrelated to the length of the class period or the probability of a SCA being settled. These findings are consistent with the tacit power of lobbying firms declining as a result of the enactment of SOX, which has improved the incentives for economic agents to reveal evidence of corporate misconduct.

Finally, the interrelationship between corporate innovation and SCAs is examined in Chapter 4. This chapter examines whether a firm's innovative activities are associated with the *ex-ante* risk of litigation. Furthermore, this chapter also investigates the impact the filing of a SCA has on corporate innovation. Chapter 4 examines the following research questions: (1) Are firms that innovate more likely to be subject to a SCA than firms that do not innovate? (2) Amongst firms that innovate, are firms that are relatively less innovatively successful more likely to be sued? (3) Does innovative efficiency improve after the filing of a SCA?

Chapter 4 makes several key contributions to the extant literature. First, this chapter is the first empirical work that explicitly examines whether firms innovative activities are related to the filing of a SCA. This study, therefore, enhances the current understanding of the determinants of shareholder litigation. Second, this chapter contributes to the literature on the consequences of SCAs. Specifically, this chapter examines the impact a filing of a class action has on a firm's innovative activities.

A summary of the key findings of Chapter 4 are as follows. Firms are more likely to be sued if they have invested in innovation, relative to those that do not invest. It is argued that this finding is a result of firms that innovate having greater opportunities to commit misconduct. Further, among innovating firms, the relative level or change in innovative success is negatively associated with the probability of shareholder litigation. This finding is consistent with the expectation that firms that are struggling to innovate face greater pressures to violate securities laws. Post-filing investment in innovation immediately declines, which appears to result in a decline in the number of patents produced in the following years. However, the quality of patents being produced, as well as the overall innovative efficiency, is relatively unaffected by the filing of a class action.

Although the analyses in this thesis are conducted on SCAs that were filed in the US the findings will be of use for market-participants and policymakers outside of the US. The findings of this thesis are relevant not only from an investor or other stakeholder's perspective but also for regulators. This thesis sheds light on not only the causes of shareholder litigation, which can be useful for detection and prevention of misconduct, but also the consequences. Hence, the findings reported contribute to a better understanding of the costs and benefits of shareholder litigation. As such, this thesis serves to provide a better understanding of the efficacy of SCAs as a corporate governance mechanism.

Chapter 2

SCAs, Banking Relationships and Lender Reputation

2.1 Introduction

The revelation of corporate misconduct can cause irreparable damage to the reputation of a firm and its stakeholders. Lenders, therefore, have an incentive to avoid being associated with firms accused of misconduct. However, it will not always be possible for lenders to avoid firms that end up being sued. As a result of reputational damage, the filing of a securities class action (SCA) may adversely impact a firm's ability to raise debt financing. Despite the high frequency of SCAs, the response of lenders to these filings is not fully understood. This chapter extends the current state of the literature by examining whether *reputable* and *relationship* lenders are associated with corporate misconduct, based on those lenders distinguishing characteristics. Specifically, this chapter examines whether a SCA impacts a firm's debt financing terms and its *relationship* with its lenders. Furthermore, this study also investigates whether *reputable* lenders are better at screening and monitoring for potential misconduct.

Theory emphasises the importance of two different lending characteristics: lender *reputation* (e.g. Chemmanur and Fulghieri, 1994a; b) and lending *relationships* (e.g. Greenbaum et al., 1989; Sharpe, 1990; 1995; Diamond, 1991; Rajan, 1992; Boot and Thakor, 1994; Petersen and Rajan, 1995). These two unique attributes of lending

dynamics can help to mitigate information asymmetry problems through enhanced incentives or repeated interactions. As a result, the *reputation* of a lender and a *relationship* with a lender can provide various costs and benefits to borrowing firms.

Theory suggests that *reputable* lenders have greater incentives to apply more rigorous *ex-ante* screening of prospective borrowers (Chemmanur and Fulghieri, 1994a) and undertake more *ex-post* monitoring of borrowing firms in order to maintain their reputation (Chemmanur and Fulghieri, 1994b). This theory would suggest that reputable lenders should be more capable of avoiding firms that eventually face litigation as a result of better screening processes. Reputable lenders should also be able to provide more adequate oversight via their enhanced monitoring activities and limit the possibility of misconduct occurring. In the first part of this chapter, the association between the incidence of misconduct and the reputation of lenders is examined.

Relationship lending can help to mitigate potential problems associated with information asymmetry between lender and borrower through repeated interactions. This improved transparency with its lenders can result in significant benefits and costs to borrowing firms.[10] The benefits that can accrue from relationship lending include: smaller spreads, greater availability of financing and a lower probability of requiring collateral (Petersen and Rajan, 1994; Berger and Udell, 1995; Bharath et al., 2011). Relationship lending can also result in borrowing firms facing hold-up costs as a result of being informationally captured (see Greenbaum et al., 1989; Sharpe, 1990; Rajan, 1992; Petersen and Rajan, 1995). The filing of a class action creates uncertainty about the prospects of a firm. This increased uncertainty will also enhance the informational advantage held by relationship lender, relative to outside lenders. As a result, sued firms may become more informationally captured and will, therefore, be stuck in a relationship with a lender. Alternatively, lenders may be more willing to help firms out during periods of distress to sustain a relationship and obtain benefits from that relationship in the long run. In either case, it would be expected that firms will be more likely to continue a lending relationship after being sued.

Which lenders a firm borrows from post-filing is also likely to be a key determinant of the terms received on new loans. Recent research has found that lenders alter loan terms after the filing of a SCA. Firms pay higher loan spreads after the filing of a class action

[10] See Boot (2000), Ongena and Smith (2000) and Elyasiani and Smith (2004) for surveys of research on relationship lending.

and other non-price terms are also adversely impacted (Deng et al., 2014; Yuan and Zhang, 2015). The reputational penalties incurred by sued firms may be impacted by the relationship a borrowing firm has with its lender. If sued firms become informationally captured by their relationship with a lender they may lose significant bargaining power, which could result in greater reputational penalties. These greater reputational penalties could stem from the loss of the benefits in loan terms associated with lending relationships (see Petersen and Rajan, 1994; Berger and Udell, 1995; Bharath et al., 2011). Alternatively, lenders may be willing to support borrowing firms that they had a relationship with after the filing of a SCA. Lenders may help sued firms by providing more favourable loan terms, effectively offsetting any reputational damage. Whether firms are able to sustain a relationship with its lenders and how lenders deal with sued firms is an important empirical question. Consequently, the findings of this chapter provide an important insight into whether relationships with lenders help or hinder a sued firms' ability to recover from the accusation of misconduct.

To summarise, this chapter addresses the following three research questions:

1) Are firms that borrow from reputable lenders less likely to be subject to a SCA?
2) Are firms more likely to continue a relationship with a lender after the filing of a SCA?
3) Do firms with an existing relationship with a lender receive more favourable terms on new loans than sued firms without a relationship after the filing of a SCA?

Further, this chapter provides three major contributions to the existing literature on SCAs and debt financing. First, this chapter is the first empirical work to investigate whether *reputable* lenders are more capable of avoiding or limiting the occurrence of corporate misconduct. The findings provide insight as to whether the theoretical proposition that reputable lenders have enhanced incentives to screen and monitor has any empirical validity. Second, this chapter is the first to examine if a firm's *relationship* with its lender is impacted by the filing of a class action. The results give an understanding of the dynamics of relationship lending and its potential importance in gaining access to capital during periods of distress. Finally, this chapter also analyses how loan terms change after being sued, taking into account a firm's *ex-ante relationship* with its lenders.

This paper extends the works of Deng et al. (2014) and Yuan and Zhang (2015) by taking into account the *relationship* firms have with its lenders before being sued.

With respect to the first research question, the results of this chapter show that firms are less likely to face a SCA if they borrow from a *reputable* lender. The evidence suggests that this is a result of reputable lenders being less likely to lend to firms with high litigation risk, which is probably a result of reputable lenders having greater incentives to effectively screen prospective borrowers. However, there is no evidence to suggest that reputable lenders enhanced incentives to monitor borrowers, impacts the occurrence of misconduct. As such, reputable lenders appear to be more capable of avoiding high litigation risk firms through *ex-ante* lending decision but are no better than other banks at limiting the incidence of managerial malfeasance *ex-post* (once a loan has been made).

In terms of the second research question, if a firm did not have a *relationship* with a lender prior to the filing of a class action, they are unlikely to be able to develop a relationship with a lender after being sued. However, firms with an existing lender relationship are more likely to continue to borrow from the same lender after being sued.

For the third research question, reputational penalties are investigated by examining the characteristics of loans originated after the filing of a class action with respect to the relationships a firm had with its lenders. If a firm did not have a relationship with a lender pre–filing, loans initiated after being sued are more likely to exhibit larger spreads and have shorter maturities. These changes in loan terms are consistent with firms being penalised after being sued. However, consistent with expectations sued firms that have an *ex-ante relationship* with a lender receive more favourable loan terms than sued firms without a relationship. These benefits include relatively smaller spreads and better access to more capital. These findings suggest that banks may be willing to provide more lenient loan terms to ensure a continuing relationship with a borrowing firm. Overall, the results suggest that lending relationships are beneficial for a firm's recovery from the revelation of misconduct.

The remainder of this chapter is organised as follows. In Section 2.2 the key hypotheses that are tested are outlined. Section 2.3 provides an overview of the methodologies and data used. Section 2.4 presents the empirical results and Section 2.5 contains the concluding remarks.

2.2 Hypothesis Development

2.2.1 Reputation of Lenders

The US commercial loan market is dominated by syndicated loans, which are issued jointly by a number of lenders. The lead arranger of these loans is responsible for the screening of potential borrowers (pre-loan due diligence) and monitoring after the loan is made.[11] Other participants in syndicated loans typically take a more passive role and rarely negotiate directly with the borrower. Participants in the syndicated loan market include not only large banks but also non-bank institutional investors (Ivashina and Sun, 2011). These non-bank participants typically do not have the processes in place to effectively screen and monitor borrowers, relying instead on the lead arrangers for these procedures. Consequently, the quality of the lead arranger plays an important role in the "certification" of borrowing firms (see Bushman and Wittenberg-Moerman, 2012).

One way to identify the quality of a lender is by their reputation. The reputation of a financial intermediary functions as a bonding mechanism, creating incentives to screen and monitor borrowing firms (Booth and Smith, 1986). Therefore, to maintain a good reputation, a lender must ensure that they only lend to quality companies. This is done by effectively screening and monitoring borrowing firms.

Chemmanur and Fulghieri (1994a) develop a model of the screening process used by banks. In their model, more reputable banks apply more rigorous *ex-ante* screening of prospective borrowers and as a result will be more likely to lend to firms with better future prospects. Consistent with this, prior research has found that the reputation of a financial intermediary plays an important certification role. For example, firms that borrow from reputable lenders are more likely to perform better in the future and have better credit quality (Bushman and Wittenberg-Moerman, 2012). Furthermore, loan announcement abnormal returns are positively related to the lenders' reputation (Billett et al., 1995; Ross, 2010). These positive announcement returns can be viewed as a certification of the quality of a firm stemming from the due diligence performed by the reputable lenders. Overall, the literature indicates that the reputation of lenders is important for certifying the quality of borrowing firms.

[11] Throughout this chapter, the lead arranger will be referred to as the lender.

This enhanced due diligence and certification process will likely have an impact on the ability of high litigation risk firms being able to borrow from a reputable lender. Prior research has found that sued firms are more likely to exhibit agency issues and have poorer performance (e.g. Peng and Roell, 2008; Gande and Lewis, 2009; McTier and Wald, 2011). Since reputable lenders have greater incentives to effectively screen prospective borrowers, they should be less likely to lend to firms with potential issues or poorer prospects. Consequently, firms that are more likely to commit misconduct should be relatively less likely to be able to borrow from a reputable lender. Therefore, it is expected that sued firms are less likely to borrow from reputable lenders.

It is also possible that firms that borrow from reputable lenders will be less likely to be sued as a result of more rigorous monitoring. Chemmanur and Fulghieri (1994b) develop a model that indicates that more reputable banks have greater incentives to undertake *ex-post* monitoring activities. Prior research suggests that firms that are accused of corporate misconduct do not have adequate oversight (McTier and Wald, 2011). The lack of oversight likely provides managers with the opportunity to commit corporate malfeasance. The more rigorous monitoring applied by reputable lenders will likely result in fewer opportunities to commit misconduct.

Based on this discussion there are two possible explanations for why sued firms will be less likely to have borrowed from a reputable lender. First, high litigation risk firms will be more likely to be screened out by reputable lenders and are, therefore less likely to borrow from a reputable lender *ex-ante*. Second, as a result of superior *ex-post* monitoring, firms borrowing from reputable lenders will be less likely to violate securities laws. Both of these explanations (better screening and monitoring) lead to the expectation that firms that borrow from a reputable lender will be less likely to be sued. This leads to the first hypothesis which, in turn, relates to research question 1.

Hypothesis 1: Firms that borrow from a reputable lender will be less likely to have a SCA filed against them.

2.2.2 Lending Relationships

Lenders can obtain proprietary information about a borrower through repeated interactions, thereby reducing information asymmetry. The improved transparency between lender and

borrower facilitates monitoring and some of these benefits are passed onto the borrower.[12] Consistent with this information asymmetry theory, prior research indicates that repeated borrowing from the same lender results in lower spreads, reduced collateral requirements and better access to larger loans (Petersen and Rajan, 1994; Berger and Udell, 1995; Bharath et al., 2011). Covenants are also more likely to be relatively less tight for firms with a lending relationship (Prilmeier, 2017). Furthermore, lenders are more willing to provide credit to a firm with which it has an existing relationship and that the length of the relationship is unimportant (Cole, 1998).

Relationship lending also comes at a cost to borrowers. Lenders acquisition of proprietary information can result in borrowers being informationally captured and provide lenders with the opportunity to extract rents. These hold-up costs are formally modelled by Greenbaum et al. (1989), Sharpe (1990), Rajan (1992) and Petersen and Rajan (1995). In an empirical study, Kim et al. (2003) model switching costs associated with retail lending in Norway. The authors estimate that the average switching cost is 4.1%, which is approximately one-third of the average interest rate on loans. As a result of these relatively high switching costs, customers become locked into their existing lending relationships. Although the focus of the Kim et al. (2003) study was on retail lending, the same hold-up costs exist for larger corporate borrowers. In a related study, Ioannidou and Ongena (2010) present evidence that interest rates on loans obtained from a new bank are significantly lower than comparable loans from existing lenders. The new bank uses lower interest rates to entice customers to switch banks but then afterward increases rates. This strategy is consistent with bank hold-up costs stemming from borrowers becoming informationally captured.

Theory suggests that relationship building is more valuable for firms with high information asymmetry (Rajan, 1992; Boot and Thakor, 2000). Consistent with this, Gopalan et al. (2011a) find informationally opaque private firms are more likely to sustain an existing lending relationship. As such, the information environment plays an important role in both the benefits that borrowers can accrue as well as the hold-up costs they face. Evidence suggests that less transparent firms face higher interest rates as a result of the informational monopoly that banks hold. For example, Hale and Santos (2009) find that following the first public bond issuance, firms are able to borrow at lower rates. This

[12] Diamond (1991) and Boot and Thakor (1994) formally model the benefits associated with long-term relationships.

finding supports the theory that banks are able to hold up borrowers by charging higher interest rates as a result of the informational monopoly they hold. Similarly, Schenone (2010) find that the average loan interest rate falls following a borrowers' equity IPO. Furthermore, information sharing results in a reduction in the benefits associated with relationships (Gehrig and Stenbacka, 2007). Overall, these papers suggest that the greater the informational advantage the lender holds, the higher the hold-up costs. The uncertainty created by the filing of a class action will increase the informational advantage of relationship lenders. As such, hold-up costs would be expected to increase after a firm is sued, which will result in these firms being informationally captured by their lenders.

Banks must take a long-term perspective on relationship lending so that they can maximise the rents stemming from the informational monopoly they hold. As such, they have an incentive to maintain a lending relationship even during periods of distress or when borrower credit quality deteriorates. Consistent with this, Longhofer and Santos (2000) theorise that firms with lending relationships will be less likely to face credit constraints. Supporting this hypothesis, numerous papers have found that during a crisis firms are more likely to receive a loan with more favourable terms from a relationship bank (Jiangli et al., 2008; Cotugno et al., 2013; Bolton et al., 2016). Elsas and Krahnen (1998) also find evidence to suggest that lenders will support firms that suffer a decline in credit quality if they have a relationship with them. Examining the German market, the authors find that housebanks (equivalent to a relationship lender) provide liquidity insurance for unexpected declines in borrower ratings. However, for large rating declines (more than two rating classes), there is no evidence of liquidity insurance. Furthermore, Rosenfeld (2014) finds that firms that obtain a loan from a relationship lender in the six months prior to distress are more likely to emerge from distress. These results indicate that banks may be willing to continue to provide access to capital despite the financial distress that may result from the filing of a SCA.

To summarise, there are two possibilities for why a lending relationship may continue even after a firm has been sued. First, firms may be informationally captured and as a result of hold-up costs, be unable to borrow from alternative lenders. Second, banks may want to continue the lending relationship so that they can benefit by extracting future rents. These two propositions are not mutually exclusive and both effects will result in sued firms continuing a relationship with their lender.

Alternatively, it is also possible that lenders may discontinue a relationship with a firm to avoid potential negative reputation effects. The revelation of fraud not only impacts the fraudulent firm but it also negatively affects those associated with the firm. Lin and Paravisini (2011) find that lenders to firms that commit fraud suffer a loss in reputation following the discovery of the fraudulent activity. These lenders see a reduction of at least 25% in new syndicated loans during the two years following the fraud discoveries. Lenders to firms that commit fraud are also more likely to hold a larger portion of loans when they perform a monitoring role, which is consistent with these lenders being required to have more skin in the game.

In similar research, Gopalan et al. (2011b) analyse the effect that large-scale bankruptcies have on lead arrangers' reputation. They find that lead arrangers in these cases are less likely to syndicate loans and retain larger fractions of syndicated loans, which is consistent with reputational damage. Dahiya et al. (2003) find negative returns when a corporate borrower announces default. The loss sustained by lenders is larger if they had a relationship with the borrower. Furthermore, Jorion and Zhang (2009) find that bankruptcies result in significant negative market reactions and higher credit default swap (CDS) spreads for creditors. Creditors are also more likely to face financial distress if they have large exposures to firms that become bankrupt. These findings indicate that poor performance and illegal activities can have a negative impact on a firm's creditors. As a result, lenders may terminate a relationship with a firm that has been sued in order to avoid being associated with that firm and to evade any future distress that may arise from the class action.

Based on this discussion, it is possible that the filing of a class action may plausibly lead to either the ending of a lending relationship or, alternatively, increase the firm's dependence on the relationship. In the context of these conflicting forces, it is hypothesised that the benefit, on average, of a lending relationship with a bank, in the form of future rents, will likely exceed the negative reputational consequences that may stem from continuing to lend to a sued firm. As such, it is postulated that firms with *ex-ante* banking relationships will be informationally captured and their banks will be more willing to support them even after being sued. This leads to the second hypothesis which, in turn, relates to the second research question explored in this chapter.

Hypothesis 2a: Firms are more likely to continue a relationship with a lender after the filing of a SCA.

As discussed, it is also possible that the relationship between a firm and a lender ends up ceasing as a result of the filing of a class action. As such the following alternative hypothesis is also examined in this chapter.

Hypothesis 2b: Firms are less likely to continue a relationship with a lender after the filing of a SCA.

2.2.3 Loan Terms

Prior research has found that firms suffer reputational penalties as a result of the filing of a class action. For example, firms face a significant negative market reaction to the filing of a class action (Griffin et al., 2004; Gande and Lewis, 2009; Bauer and Braun, 2010) and a higher cost of equity post-filing (Chava et al., 2010). Consequently, the filing of a class action will likely negatively impact a firm's reputation with its lenders. Consistent with this expectation, Deng et al. (2014) and Yuan and Zhang (2015) find that firms subject to class actions suffer reputational penalties in terms of poorer price and non-price terms of bank loan contracts. Both studies find sued firms pay significantly higher loan spreads after the filing. However, they present conflicting evidence on the effect class actions have on non-price terms. On the one hand, Deng et al. (2014) find that sued firms face more financial covenants and are more likely to require collateral, but find no impact on the maturity of loans. On the other hand, Yuan and Zhang (2015) find that after the filing, loans are shorter in maturity but the number of covenants and collateral required are unchanged. In related research, Graham et al. (2008) find loans initiated after a financial restatement have significantly higher spreads, shorter maturities, are more likely to require collateral and include more covenant restrictions. Overall, the literature indicates that corporate misreporting or misconduct undermines a firm's reputation with lenders resulting in tighter loan contract terms.

As outlined in the discussion of Hypothesis 2a, there are numerous benefits that can be gained by firms that develop a relationship with a lender. These benefits come in the form of more favourable loan terms (see Petersen and Rajan, 1994; Berger and Udell, 1995; Cole, 1998; Bharath et al., 2011; Prilmeier, 2017). These favourable terms can be

attributed to the enhanced transmission of information that occurs within a lending relationship.

Banks may be relatively more willing to support sued firms that they had a relationship with following the filing of a class action. Relationship lenders will likely help sued firms by providing more lenient loan terms in order to extend the relationship and benefit by extracting future rents. Consequently, although sued firms that have a relationship with a lender may still face reputational penalties, it would be expected that these penalties will be relatively less severe for sued firms without a lending relationship. Sued firms with an *ex-ante* lending relationship should, therefore, receive relatively more favourable loan terms than firms without an *ex-ante* relationship.

Alternatively, sued firms that have a relationship with a lender may suffer more severe reputational penalties. The filing of a class action creates significant uncertainty about the ability of firms to repay its debt. This uncertainty could result in firms being informationally captured by lenders with which they had a relationship. As a result of the increased uncertainty, sued firms that are involved in a relationship with a lender could also lose significant bargaining power. Based on this loss of bargaining power argument, it would be expected that firms will also lose the benefits associated with a lending relationship. As mentioned above, the benefits stemming from relationships with a bank come in the form of more favourable loan terms. Based on this argument, it would be expected that firms with an *ex-ante* lending relationship will be subjected to more severe reputational penalties following the revelation of misconduct.

To summarise, it is possible that firms with a lending relationship could either suffer greater penalties or, alternatively, receive relatively more lenient loan terms following the filing of a class action. The future rents that banks can obtain from a lending relationship will likely, on average, be more beneficial than imposing harsher loan terms on firms that are sued. It is likely that sued firms with an existing relationship will still face reputational penalties but they are expected to be relatively better off than non-relationship sued firms. Therefore, with respect to the third research question addressed in this chapter, it is hypothesised that firms with an *ex-ante* banking relationship will receive *relatively* more favourable loan terms than firms without a banking relationship. This leads to the third hypothesis.

Hypothesis 3: After the filing of a SCA, firms that had a relationship with a lender will receive more favourable terms on new loans than sued firms without a relationship.

2.3 Method

2.3.1 Probability of Being Sued

Hypothesis 1 predicts that firms with reputable lenders will be less likely to have a SCA filed against them. As outlined in Section 2.2.1 there were two explanations used to justify this expectation: (1) reputable lenders are better at screening firms and (2) reputable lenders are better at monitoring firms. Two methods are used to examine whether these explanations are correct.

2.3.1.1 Screening Ability of Reputable Lenders

The first explanation for Hypothesis 1 is reputable lenders are better at screening firms with a high risk of being sued and as a result will be less likely to lend to them. To test this screening explanation, a two-stage model was estimated. In the first-stage, the following logit model was estimated for all firms with available data.

$$Sued_t = \beta_0 + \Sigma\beta \cdot Controls_{t-1} + \varepsilon_t \quad (2.1)$$

The dependent variable (*Sued*) in equation (2.1) is equal to one if the firm was sued in year *t* and is zero otherwise. There are numerous events surrounding the filing of a class action.[13] The focus of this chapter is on the filing of a SCA for several reasons. First, using the filing of a SCA as the key analytical date has the advantage that it is an easily identifiable exogenous event, which represents an accusation of misconduct. Second, the other events associated with the discovery of misconduct typically occur only shortly

[13] Karpoff et al. (2008a) perform an analysis of the financial costs firms face for financial fraud across these numerous key events associated with SEC enforcement actions. These key events include the violation period, which consists of the beginning date and the end date of the violation. Furthermore there is the enforcement period or enforcement events, which include a triggering event, informal inquiry, formal investigation, initial regulatory proceeding, other regulatory events and the concluding regulatory proceeding.

before the filing of a class action.[14] Finally, using the filing of a class action to analyse the occurrence of misconduct and surrounding changes is a standard approach used in the literature (e.g. McTier and Wald, 2011; Humphery-Jenner, 2012; Deng et al., 2014; Yuan and Zhang 2015).

Control variables that have been shown in previous studies to be related to the likelihood of being sued are also used in the first-stage (e.g. McTier and Wald, 2011; Kim and Skinner, 2012). These variables include firm size, leverage, ROA, book-to-market, amount of tangible assets and dividends.[15] Industry and year fixed effects are also included as controls.

The firm's *ex-ante* litigation risk is estimated from the first stage of the model. This is then used in equation (2.2) below.

$$Reputable_t = \beta_0 + \beta_1 P(Sued)_{t-1} + \Sigma\beta \cdot Controls_{t-1} + \varepsilon_t \quad (2.2)$$

The second-stage is a logit model estimated at the loan facility level of syndicated private loans.[16] This chapter analysis revolves around private syndicated loans as opposed to public forms of debt as evidence suggests that during period of distress firms are more likely to use private forms of debt (Denis and Mihov, 2003). As such, analysing syndicated loans surrounding the filing of a SCA provides a richer understanding of how corporate misconduct impacts a firm's access to capital.

The dependent variable (*Reputable*) is equal to one if a particular loan obtained in year *t* was borrowed from a lender that is deemed to be highly reputable. Following Bushman and Wittenberg-Moerman (2012) and Sufi (2007), bank reputation is identified based on the lenders loan market share. Lead arrangers who capture more than 3% of the total market share of loans are classified as highly reputable. Using this market share approach results in only the largest banks being classified as reputable. These dominant banks have greater incentives to screen and monitor in order to retain their market share and their reputation (see Section 2.2.1). Furthermore, these larger banks will likely have more

[14] The average number of days to file, which is the number of days between the end of the class period when the alleged misconduct took place over and the filing of the class action, is 108 days in the sample analysed in this chapter (see Table 2.2).
[15] See Table 2.1 for variable definitions.
[16] The Dealscan database lists each credit facility or tranche as a separate record. Syndicated loan packages typically consist of a number of facilities. Throughout this chapter the term loan refers to an individual credit facility.

sophisticated processes and have greater resource availability, which results in the superior ability to screen and monitor borrowers.

Two measures of reputation are used in this analysis. The first measure, (*Reputable (Amount)*), is the total dollar amount of loans a bank serves as the lead arranger divided by the total dollar of loans issued in that year. Reputation is also measured based on the number of loans for which the bank serves as the lead arranger relative to the total number of loans issued in that year (*Reputable (Number)*). If the proportion for either measure is greater than 3% then the bank is deemed to be reputable.

The key independent variable of interest is the litigation risk (*P(Sued)*) in year *t-1*. Based on the screening justification, it is expected that firms will be less likely to be able to borrow from reputable lenders if they have higher *ex-ante* litigation risk. As such, it is expected that β_1 will be negative.

The control variables used in this regression are similar to those used by Bushman and Wittenberg-Moerman (2012). The second-stage includes the same control variables as the first-stage. This model also includes controls for characteristics specific to the loan facility including: loan size and the loan maturity.

2.3.1.2 Monitoring Ability of Reputable Lenders

The alternative context for Hypothesis 1 is that reputable lenders are superior monitors of borrowing firm's *ex-post*, resulting in a lower likelihood of corporate misconduct. The logit regression model given in equation (2.3) is estimated to test this monitoring explanation.

$$Sued_t = \beta_0 + \beta_1 PreReputable_{t-1,t-3} + \Sigma\beta \cdot Controls_{t-1} + \varepsilon_t \quad (2.3)$$

As in equation (2.1), the dependent variable (*Sued*) takes a value of one if a class action is filed against a firm in year *t* and is zero otherwise.

The primary independent variable of interest in this analysis is *PreReputable*. *PreReputable* is a dummy variable equal to one if a firm has obtained a loan in the prior three years (*t-1 to t-3*) where the lead arranger is deemed to be reputable. As mentioned above, lender reputation was determined based on loan market share (see Section 2.3.1.1). It is expected that reputable lenders are better at monitoring firms and ensuring that

managers do not violate securities laws (see Section 2.2.1). If this expectation is correct, the coefficient for the *PreReputable* variable will be negative.

The control variables used in this model are the same as those used in equation (2.1).

2.3.2 Lending Relationship after Filing

Hypothesis 2a predicts that, after the filing of a SCA, sued firms will be more likely to continue a relationship with a lender.

To examine this hypothesis, loans initiated around the filing of a class action are examined. Loans are analysed from three years prior to the filing of a SCA and up to three years after the filing. Firms are included in the sample if they have been sued and have obtained at least two bank loans where one is obtained during the three-year period prior to the filing and the other is taken during the three-years after the filing.[17] As such, this is a within sample analysis examining only those loans that are obtained by firms that were sued within the three year window surrounding the filing year.[18]

The following logit regression was then estimated at the loan level.

$$Relationship_t = \beta_0 + \beta_1 PostFiling + \beta_2 PreRel + \beta_3 PreRel * PostFiling + \Sigma\beta \cdot Controls_{t-1} + \varepsilon_t \quad (2.4)$$

The dependent variable (*Relationship*) is a dummy variable for a loan that takes a value of one if the borrower and the bank have a pre-existing relationship. Similar to the approach used by Bharath et al. (2011), the *Relationship* variable is equal to one if the lead arranger of the loan had also been the lead arranger for a firm loan in the prior five years.

Hypothesis 2a predicts that sued firms will be more likely to retain a relationship with a bank. To analyse this, it is necessary to identify firms that have an established relationship in the pre-filing period. The pre-filing relationship (*PreRel*) is a dummy variable equal to one if the bank was the lead arranger for more than two loans in the five years prior to the filing of a SCA. The *PostFiling* variable is equal to one if the loan was initiated after the filing of a SCA.

[17] In unreported results, loans initiated in a five-year window around the filing year provide quantitatively similar results.

[18] In robustness tests, a control sample is selected and Hypothesis 2 and 3 are re-examined using a diff-in-diff-in-diff approach (see Section 2.4.4).

The interaction term (*PreRel*PostFiling*) coefficient indicates if there has been a change in an established relationship after the filing. If Hypothesis 2a is correct then the interaction term will have a positive coefficient. A positive coefficient would indicate that after the filing of a class action, sued firms that had a relationship with a lender are more likely to obtain a loan from the same lender. The use of this diff-in-diff style of regression analysis also helps to alleviate concerns associated with endogeneity.

The control variables used in this analysis are similar to those used in equation (2.2). Macroeconomic conditions are also controlled for using *CreditSpread*, defined as the difference in yields between BAA and AAA corporate bonds, and *TermSpread*, defined as the yield difference between 10 and 2 year Treasury bonds.[19] Robust standard errors clustered at the firm level are used throughout the analysis.[20]

2.3.3 Change in Loan Contract Terms after Filing

Hypothesis 3 predicts that, after the filing of a SCA, firms that had a relationship with a lender will receive relatively more favourable loan terms than sued firms without a relationship. The model used to test Hypothesis 3 is given by equation (2.5) below.

$$LoanFeature_t = \beta_0 + \beta_1 PostFiling + \beta_2 PreRel + \beta_3 PreRel * PostFiling + \Sigma\beta \cdot Controls_{t-1} + \varepsilon_t \quad (2.5)$$

The dependent variable (*LoanFeature*) measures one of seven loan contract characteristics. The characteristics include: loan spread, maturity, number of covenants, loan size, collateral, syndicate size and the percentage of the loan held by the lead arranger.

The main independent variable of interest is the interaction term (*PreRel*PostFiling*). This interaction term is equal to one if the firm has been sued in the prior three years and if the firm had a borrowed more than once from the same lender in the prior five years. It is expected that the reputational penalties will be relatively less severe for firms that had a relationship with a lender. In this case, the interaction term should represent the relatively more favourable loan terms. For example, research suggests that firms pay significantly higher loan spreads after the filing of a class action (Deng et al., 2014; Yuan and Zhang

[19] See Table 2.1 for all variable definitions.
[20] Clustering the standard errors at the bank level provides quantitatively similar results.

2015). It is expected that with an existing lending relationship, sued firms will receive relatively more favourable terms. Therefore, when the loan spread is the dependent variable the interaction term (*PreRel*PostFiling*) should be negative. Using this diff-in-diff style of approach is also a useful way to address concerns related to endogeneity.

The control variables will include firm characteristics, loan characteristics and measures of macroeconomic conditions and are similar to those used in prior regressions (equations (2.3) and (2.4)) and by Deng et al. (2014).

2.3.4 Data

2.3.4.1 Sample Selection

Firm financial data has been obtained from the CRSP/Compustat merged database. The sample of loans analysed are obtained from the DealScan database compiled by the Loan Pricing Corporation (LPC) of Thomson Reuters. DealScan contains detailed price and non-price terms of loans. The DealScan and Compustat databases are merged using the linking table assembled by Chava and Roberts (2008).

Data for SCAs, in the United States, are obtained from the Stanford Securities Class Action Clearinghouse (SCAC).[21] The Stanford SCAC provides information on the filing date of the suit, the outcome of the case, ticker symbol and SIC code for all class actions filed after the institution of the Private Securities Litigation Reform Act (PSLRA). All class actions listed between 1996 and 2011 with at least one loan initiated during the three years before and the three years after the filing are used for this analysis. This loan availability requirement does introduce some survivorship bias into the analysis. However, in this case, since the focus is on how relationships and loan terms change following the filing of a class action this form of survivorship bias is unavoidable. It should also be noted that requiring loans pre- and post-filing is also a standard approach used in the literature (see Deng et al., 2014; Yuan and Zhang, 2015). Only those firms that have not been sued in the prior three years are included in the sample. To be included in the sample the outcome of the case must also be known. These restrictions result in a final sample consisting of 448 class actions.

[21] http://securities.stanford.edu/

2.3.4.2 Sample Statistics

Table 2.2 shows a comparison of characteristics between sued and non-sued firms that are analysed for Hypothesis 1.[22] The most obvious difference is that sued firms are significantly larger in size based on total assets and market capitalisation. Furthermore, there are a number of significant differences between sued and non-sued loan characteristics. In the year a firm is sued loans are significantly less likely to have been obtained from a reputable lender, which is consistent with Hypothesis 1. Loans obtained by sued firms are also more likely to have a larger spread, shorter maturity, be more likely to require collateral and have a larger syndicate than non-sued firms. These findings indicate that sued firms are viewed as riskier and as a result receive stricter loan terms. Loans obtained by sued firms are also significantly larger than those obtained by non-sued firms, which can be attributed to the size difference. Furthermore, loans obtained by sued firms have fewer covenants and the lead arranger retains less of the loan relative to non-sued firms.

Table 2.3 provides a breakdown of the sample of sued firms by year and industry. In Panel A, it can be seen that the number of class actions filed in each year is relatively stable over the sample period. There was a slight increase in class actions filed in the early 2000's coinciding with the tech bubble and the Sarbanes-Oxley Act (SOX). Panel B shows the number of class actions in the sample by industry. The majority of the sample consists of class actions filed against firms in the manufacturing (36.6%), and services industries (17.9%). It should be noted that finance and utility firms are included in the sample, however, dropping these firms provides quantitatively similar results (see Appendix E).

Table 2.4 presents Spearman correlation coefficients and variance inflation factors (VIFs) for the key variables. In general, the correlations are relatively small and the variance inflation factors (VIFs) are also very small, which suggests that multicollinearity is unlikely to be an issue.

[22] All variables presented are winsorised at the 1st and 99th percentiles.

2.4 Results

2.4.1 Probability of Being Sued

This section reports the results from the tests of Hypothesis 1, which predicts that firms will be less likely to have a SCA filed against them if they have borrowed from a reputable lender.

2.4.1.1 Screening Ability of Reputable Lenders

The first justification for Hypothesis 1 was that reputable lenders have greater incentives to screen prospective borrowers and are therefore less likely to lend to firms with high *ex-ante* litigation risk. To test this, a two-stage analysis was estimated as in equations (2.1) and (2.2) (see Section 2.3.1.1). Table 2.5 reports the results from this analysis.

The coefficient for the probability of being sued (*P(Sued)*) in the second-stage is consistently negative and highly significant in all model specifications. This result strongly indicates that the higher the risk of litigation, the less likely a firm is able to obtain a loan from a reputable lender. This finding is consistent with Hypothesis 1 and suggests that reputable lenders are better at screening out firms with high litigation risk (see Section 2.3.1.1). This result provides empirical evidence to support the Chemmanur and Fulghieri (1994a) model in the context of SCAs; reputable banks apply more rigorous *ex-ante* screening of prospective borrowers which is leading them to avoid firms that are potential targets of litigation.

2.4.1.2 Monitoring Ability of Reputable Lenders

An alternative context for Hypothesis 1 is that reputable lenders have greater incentives to perform *ex-post* monitoring of borrowing firms and ensure that misconduct does not occur in the first place. Equation (2.3) is estimated to test this relationship. The results are reported in Table 2.6. The dependent variable for these models takes a value of one if the firm was sued in year *t*. If the monitoring explanation is correct then the coefficient for the *PreReputable* variables should be negative. However, both variables are insignificant indicating that whether a firm had borrowed from a reputable lender has no impact on the probability of a SCA being filed. This result suggests that the possibility of reputable

lenders providing superior monitoring does not affect a manager's propensity to commit misconduct.

The lack of a finding here could be in part attributed to reputable lenders being better screeners and avoiding high litigation risk firms in the first place (as noted in Section 2.4.1.1). The probability that sued firms obtain a loan from a reputable lender in the three years prior to the filing is significantly less than for non-sued firms (29.9% vs. 35.8%). Despite this difference sued firms are still able to obtain loans from reputable lenders. As such, the findings indicate that a reputable lenders enhanced incentive to monitor does not have an impact on the likelihood of a borrowing firm being sued.

Overall, there is evidence to suggest that firms that borrow from reputable lenders are less likely to be sued. Firms borrowing from reputable lenders do not appear to be less likely to be sued as a result of better monitoring. Instead, the results indicate that this relation is a result of reputable lenders being better at screening out potential borrowers with high litigation risk and as a result, other banks are left to lend to these riskier firms. As such, it appears that it is only possible for reputable lenders to avoid lending to firms that are at a greater risk of being sued. Furthermore, firms borrowing from a reputable lender do not appear to be less likely to commit misconduct, despite reputable lenders having greater incentives to perform more rigorous monitoring. Reputable lenders monitoring activities, therefore, appear to have no effect on curbing the probability of borrowing firms violating securities laws. These findings suggest that the occurrence of corporate misconduct cannot be stopped, it can only be avoided. This has implications for bank loan policies, efforts to screen rather than monitor are likely more effective at reducing instances of lending to firms subject to SCAs.

2.4.2 Lending Relationship after Filing

Table 2.7 reports the estimated models given in equation (2.4), which test Hypothesis 2a and 2b. Table 2.7 reports estimates from three different setups. The first two models (*All*) were estimated for all sued firms. The sample of class actions was then split in two based on the outcome of the case (*Dismissed* and *Settled* columns). Dismissed cases are more likely to be frivolous in nature and typically indicate that no managerial misconduct has occurred. Whereas settled cases are more likely to be meritorious in nature and these cases are therefore more likely to be instances of managerial misconduct. By splitting the

sample into two, based on the outcome, an understanding of the importance of the merits of the case can be ascertained.[23]

If Hypothesis 2a holds, the coefficient for the interaction term *PreRel*PostFiling* will be positive indicating that after being sued firms with an existing lending relationship are more likely to continue borrowing from that lender (see Section 2.3.2). However, the coefficient for the interaction term varies both in sign and significance across all three models. When the class action is dismissed, a negative and marginally significant relationship is found. Whereas for class actions that were settled, a positive and significant relationship is evident. Under Hypothesis 2a, the more severe the misconduct, the more likely it is for firms to retain a relationship with a lender. Consistent with this expectation, a positive coefficient is found for the *PreRel*PostFiling* term in the last regression model (*Settled*), which indicates that firms that had a relationship with a lender are more likely to keep borrowing from that lender after being sued. This finding is consistent with sued firms being informationally captured by banks (see Greenbaum et al., 1989; Sharpe, 1990; Rajan, 1992; Petersen and Rajan, 1995). Given this result, it is possible that the reputational losses stemming from the filing of a class action may limit a firm's ability to obtain a loan from another bank. Sued firms may, therefore, have no other option but to borrow from a lender with whom they have a relationship. Alternatively, lenders may be more willing to help sued firms through the period of distress to extract future rents by preserving the relationship.

The *PostFiling* variable also provides insight into how relationships with lenders change after the filing. The *PostFiling* coefficient is negative and significant when a class action is settled but it is not significant when cases are dismissed. These results suggest that the more meritorious the case is, the less likely a firm will be able to borrow from the same bank, if they did not have a relationship before being sued. As such, it seems that reputational penalties impact a firm's ability to obtain financial capital and to establish a relationship after being sued.

Overall, the results show that reputational penalties may impact a firm's borrowing options after being sued. If a firm did not have a relationship with a lender, they are less likely to develop one post-filing. In contrast, as a result of being informationally captured, an inability to borrow from other banks, or as a result of lending banks wanting to help out

[23] This partitioning of cases based on the outcome is used throughout the analyses in this thesis to provide an understanding of whether the merits of the case are important.

relationship clients during times of stress, firms with a relationship with a lender prior to filing are more likely to continue borrowing from that lender. This suggests that relationships play an important role in the ability of firms to maintain access to capital after being sued.

2.4.3 Change in Loan Contract Terms after Filing

2.4.3.1 Summary of Results for Settled SCAs

Next Hypothesis 3 is tested, namely, that, after the filing of a SCA, firms that had a relationship with a lender will receive more favourable loan terms than firms without a relationship. Loan size, maturity, covenants, spread, collateral, syndicate size and percentage of loan held by the lead arranger are the seven loan characteristics analysed to explore the extent of reputational penalties.

Table 2.8 summarises the results for those cases that were settled. Two models were estimated for this analysis: (1) a reduced model, which includes the *PostFiling* dummy variable and control variables, and (2) a difference-in-difference (diff-in-diff) model, which includes the *PostFiling* and *PreRel* dummy variables as well as the interaction term (*PreRel*PostFiling*) and control variables. The reduced model is similar to the analysis conducted by Deng et al. (2014) and Yuan and Zhang (2015) and as such should provide similar results to those studies. The interaction term *PreRel*PostFiling* in the diff-in-diff model is the primary variable of interest and will provide insight as to whether Hypothesis 3 is supported. The expected coefficients for the two variables of interest, *PostFiling* and *PreRel*PostFiling*, are reported in Table 2.8. The expectation is that sued firms with a lending relationship will receive more favourable loan terms after being sued, effectively offsetting the reputational penalties being faced by sued firms.

It is important to note that the results reported in Table 2.8 are estimated on the sample of sued firms. This within sample analysis is relatively restrictive and excludes the variation associated with non-sued firms. As a result, the coefficient for the *PreRel* variable is occasionally inconsistent with the literature. The main purpose of this analysis is to determine the impact of the filing of a class action has on loan terms with respect to a

firm's *ex-ante* lending relationship. As such, the inconsistencies between the observed *PreRel* variable and the literature are unlikely to be adversely impacting results.[24]

When loan spread is the dependent variable, the coefficient for the *PostFiling* variable is positive and significant in both models. This indicates that after the filing of a class action, the average loan spread is greater than the pre-filing period. This result is consistent with expectations as well as prior studies (see Deng et al., 2014; Yuan and Zhang, 2015).

Consistent with expectations the *PreRel*PostFiling* coefficient is significantly negatively related to the spread. The negative relation indicates that, after the filing of a class action, sued firms that had an existing relationship with a lender are significantly better off, relative to sued firms without a relationship. This suggests that any reputational damage that occurs as a result of the filing of a class action can be largely offset if the firm has a lending relationship. This result is also consistent with relationship lenders being more willing to support firms during periods of distress, such as after the filing of a class action, by providing loans with relatively lower yields (see Section 2.2.3).

The *PreRel* is insignificant in the diff-in-diff model with loan spread as the dependent variable. This finding is inconsistent with Berger and Udell (1995) and Bharath et al. (2011) who find firms that have a relationship with a lender benefit through smaller loan spreads. As previously mentioned this is likely a result of conducting a within sample analysis.

Loan size, has an insignificant coefficient for the *PostFiling* term in both models. This indicates that the filing of a SCA has no impact on the amount being borrowed relative to the pre-filing period.

On the other hand, the *PreRel*PostFiling* coefficient is positive and significant when loan size is the dependent variable. This indicates that after the filing sued firms that had a relationship with a lender obtain loans that are larger relative to sued firms that did not have a relationship. The *PreRel* coefficient is also positive and significant indicating that firms with a relationship have greater access to loans, which is consistent with Bharath et al. (2011). Taken together, this suggests that sued firms with a relationship have greater access to capital. This finding supports Hypothesis 3 and suggests that sued firms with a

[24] In robustness tests, a control sample is used to help ameliorate these concerns (see Section 2.4.4). In these robustness tests, the *PreRel* variable is often more consistent with the literature (see Table 2.17).

lending relationship appear to be relatively better off than sued firms without a relationship.

The next loan characteristic to be analysed is loan maturity. Consistent with expectations, the *PostFiling* coefficient is negative and significant in the reduced model. However, it is insignificant in the diff-in-diff model. This result indicates that post-filing sued firms obtain loans with shorter maturities, which is consistent with Yuan and Zhang (2015).

The *PreRel*PostFiling* interaction coefficient is not significantly related to loan maturity. Whereas, the *PreRel* variable is positive and marginally significant. This finding conflicts with Bharath et al. (2011) who find that firms that have a relationship with a lender are more likely to obtain shorter maturity loans. However, the coefficient for the *PreRel* variable is only marginally significant and as already mentioned, it could be the result of conducting a within sample analysis. The findings suggest that, contrary to expectations, having a relationship with a lender has no significant impact on the maturity of loans a firm obtains after being sued.

To examine the collateral requirement characteristic, logit regressions were estimated where the dependent variable equals one if the loan required some form of collateral. Bharath et al. (2011) find that firms with an existing lender relationship are less likely to require collateral. Contrary to this finding, the *PreRel* coefficient in the diff-in-diff model is insignificant when loan collateral is the dependent variable, which again can be attributed the analysis being conducted only on firms that were sued. In these models, neither the *PostFiling* nor the *PreRel*PostFiling* variable are significant. This indicates that the filing of a class action does not have an impact on the likelihood of a loan having a collateral requirement irrespective of whether the firm had a relationship with a lender.

A similar result is also observed when the number of covenants is the dependent variable. The *PostFiling* and the *PreRel*PostFiling* variables are insignificant in both models. This result suggests that the filing of a SCA does not have an impact on the number of covenants imposed on new loans, which is consistent with Yuan and Zhang (2015). The results using collateral and the number of covenants as the dependent variable do not support Hypothesis 3.

Next, the size of the syndicate is examined. Lee and Mullineaux (2004) find that syndicates are smaller when credit risk is relatively high. As a result of the uncertainty associated with the future of sued firms, loans for these firms should be obtained from

smaller syndicates post-filing. However, *PostFiling* is insignificant in both the reduced and the diff-in-diff models.[25]

A firm can build reputational capital with a lender by borrowing from the same lead arranger over time. As a result of a firm developing a good reputation with a lender, the lead arranger may be able to establish larger loan syndicates due to the lower perceived risk. The *a priori* expectation is that firms with an existing lender relationship are viewed as being more trustworthy and the syndicate size is, on average, larger. Consistent with this expectation, the *PreRel* coefficient is positive and significant when syndicate size is the dependent variable. However, the *PreRel*PostFiling* variable is insignificant. This finding indicates that the larger syndicate size evident in firms with a relationship is not impacted by the filing of a SCA. The combined effect of these two results (*PreRel + PreRel*PostFiling*) is significant (5%). In a lending relationship the lender can obtain proprietary information about a borrower as a result of repeated interactions. This reduction in information asymmetries will provide the lender with a greater understanding of the underlying risks associated with the borrower. Therefore, a lender providing a loan to a borrower that it has a relationship with will serve as a certification of the quality of the borrower (see Bosch and Steffen, 2011). As a result, loan market participants will likely view loans provided by relationship lenders to be relatively less risky and form larger syndicates. The evidence of a larger syndicate size for sued firms with a relationship is, therefore, likely a result of this certification process.

The final loan characteristic analysed is the percentage of the loan held by the lead arranger. Lenders will retain a higher percentage of a loan or have more skin in the game if a borrower is risky. Therefore, it is expected that after being sued lenders will be more likely to hold a higher percentage of loans. Consistent with expectations, the *PostFiling* variable is positive and significant in the reduced model but it is insignificant in the diff-in-diff model. The *PreRel*PostFiling* variable is also insignificant in the diff-in-diff model. The *PreRel* variable is negative and marginally significant indicating that if a firm had a relationship with a lender then the lender is likely to hold on to a smaller percentage of the loan. However, the overall effect of obtaining a loan post-filing and having a relationship with a lender (*PreRel + PreRel*PostFiling*) is insignificant. As such, there is little evidence to indicate that lenders view sued firms as riskier after the filing of a SCA.

[25] After including a sample of control firms, the post-filing effect for sued firms is found to be negative and significant, which is consistent with expectations (see Table 2.17).

2.4.3.2 Full Results

The reputational penalties that firms face after being sued are also related to the merits of the case. Tables 2.9 to 2.15 present three regression models where the dependent variable is one of the seven loan characteristics. Three models are presented in each table. The column labelled "All" refers to all sued and control firms. The other two models are subsamples based on whether the SCA was dismissed or settled. If the class action was settled then the case is more likely to have merit and as such should face more severe reputational penalties.

In reference to Tables 2.9 to 2.15, the *PostFiling* coefficient in the dismissed models is either insignificant or the relationship is not as strong as in the settled model. In Table 2.9, where loan spread is the dependent variable, the *PostFiling* coefficient is more positive when the case was settled than if it was dismissed, for both models. However, when a firm has a relationship with a lender before being sued, the increase in loan spread is largely offset when the case is meritorious. When loan maturity is the dependent variable (see Table 2.11) the *PostFiling* coefficient is insignificant in the dismissed models and significant in the settled reduced model.

Overall, the results support Hypothesis 3 and indicate that sued firms with a relationship with a lender are relatively better off. Sued firms with a relationship have greater access to larger loans and the loan spreads that they face are significantly less than sued firms without a relationship. Firms that have a relationship with a lender also have significantly larger syndicates, which are not affected by the filing of a SCA. These results indicate that lenders may be more willing to provide more favourable loan terms after a firm is sued if they had an existing relationship. This willingness to help these firms out could stem from having a greater understanding of the financial health of these firms because they have been lending to them for several years. Alternatively, lenders may be more willing to provide favourable loan terms to try and maintain a relationship with the firm in the long run (see Section 2.2.3).

2.4.4 Robustness

So far Hypotheses 2 and 3 have been analysed using a sample of sued firms. This approach raises the potential concern of selection bias. In an attempt to alleviate this concern, a control sample was also selected and the analyses were rerun using a difference-in-difference-in-difference (diff-in-diff-in-diff) approach. It should be noted that using this approach causes an issue with multicollinearity, however, the results obtained are for the most part consistent with the prior findings.

For this robustness test, a control firm is selected for each sued firm using propensity score matching (PSM) method. The matched sample is used to compare sued and non-sued firms. The propensity score is the probability of a class action being filed against a firm based on observable characteristics. The propensity score for each firm-year is estimated using the coefficients obtained from equation (2.1). A matched sample of up to ten non-sued firms is selected for each sued firm. The matched firms are obtained by selecting the non-sued firms with the closest propensity scores to the sued firms within the same industry (2-digit SIC). The control firms are also required to have at least two loan originations. One loan must be taken before and one loan must be taken after the corresponding matched firm's class action filing date.

2.4.4.1 Lending Relationship after Filing

To re-examine Hypothesis 2a and 2b, the following logit model was estimated for all loans obtained by sued firms as well as the sample of control firms selected using PSM.

$$\begin{aligned} Relationship_t = {} & \beta_0 + \beta_1 Sued + \beta_2 PostFiling + \beta_3 PreRel \\ & + \beta_4 PostFiling * Sued + \beta_5 PreRel * Sued \\ & + \beta_6 PreRel * PostFiling + \beta_7 PreRel * PostFiling * Sued \\ & + \Sigma\beta \cdot Controls_{t-1} + \varepsilon_t \end{aligned} \quad (2.6)$$

This is the same setup that was used in equation (2.4). The key difference is the inclusion of the *Sued* term, which is a dummy variable equal to one if the firm was sued. The *PostFiling*Sued* interaction term is equivalent to the *PostFiling* term in equation (2.4). It indicates whether the filing of a SCA has an impact on a firm's relationship with its lenders. Similarly, the *PreRel*PostFiling*Sued* term is the equivalent of the

*PreRel*PostFiling* term in equation (2.4). It provides insight into whether the relationship with lenders changes after a firm is sued if the firm had a relationship.

The results from this diff-in-diff-in-diff model can be found in Table 2.16. In the two models reported for the cases that were settled the *PostFiling*Sued* interaction term is negative and statistically significant, which is consistent with the results from the within sample analyses (see Table 2.7). This finding indicates that after being sued, firms that did not have an existing relationship with a lender are less likely to be able to establish one. When the case is settled, the *PreRel*PostFiling*Sued* is positive and significant. This result is also consistent with the findings from the within sample analyses and suggests that after being sued firms are more likely to continue a relationship with a lender (see Section 2.4.2). Also consistent with the results presented in Table 2.7, the filing of a SCA only has an impact on the relationship with a lender when the cases are more meritorious in nature. Overall, Table 2.16 indicates that the original results are robust when using a diff-in-diff-in-diff approach with a sample of control firms.

2.4.4.2 Changes in Loan Contract Terms after Filing

To test the robustness of the results relating to changes to loan contract terms after the filing of a SCA, a similar setup to equation (2.6) is used.

$$\begin{aligned} Relationship_t = {} & \beta_0 + \beta_1 Sued + \beta_2 PostFiling + \beta_3 PreRel \\ & + \beta_4 PostFiling * Sued + \beta_5 PreRel * Sued \\ & + \beta_6 PreRel * PostFiling + \beta_7 PreRel * PostFiling * Sued \\ & + \Sigma\beta \cdot Controls_{t-1} + \varepsilon_t \end{aligned} \quad (2.7)$$

The same seven loan contract characteristics are once again used as the dependent variables. As outlined in the previous section, the key independent variables of interest are the interaction terms *PreRel*PostFiling* and *PreRel*PostFiling*Sued*.

Table 2.17 presents a summary of the results for those cases that were settled.[26] Most of the coefficients found are similar to those reported in Table 2.8. When loan spread is the dependent variable the *PostFiling*Sued* interaction term is positive and significant whereas the *PreRel*PostFiling*Sued* is negative and significant. These findings are

[26] Full regression results for each of the seven loan characteristics analysed can be found in Appendix A.1 to Appendix A.7.

consistent with the previously reported findings in Table 2.8 and indicate that firms receive relatively smaller spreads after being sued if they had a relationship with the lender.

The coefficients are mostly insignificant when loan size is the dependent variable, compared to the results reported in Table 2.8. As previously mentioned there is an issue with multicollinearity in the diff-in-diff-in-diff setup stemming from the high correlation between the various dummy variables and interaction terms. As such, the insignificant coefficients when loan size is the dependent variable could be a result of multicollinearity.

For the model with loan collateral as the dependent variable the coefficient for the *PreRel*PostFiling*Sued* term is negative and significant.[27] This indicates that after being sued firms that had a relationship with a lender are less likely to have a collateral requirement on new loans. This finding is consistent with lenders being more willing to trust firms accused of misconduct if they had a prior relationship.

When syndicate size is the dependent variable, the *PostFiling*Sued* is negative and significant whereas the *PreRel*PostFiling*Sued* is positive and significant. This indicates that after being sued, lenders are more likely to form smaller lending syndicates if they did not have a relationship with the borrowing firm. Syndicates are smaller when firms have relatively high credit risk (Lee and Mullineaux, 2004). As such, the negative coefficient for the *PostFiling*Sued* term suggests that lenders view sued firms as riskier if they did not have a relationship with them. On the other hand, if lenders have an existing relationship with a sued firm, they are less likely to form a smaller syndicate. This is indicated by the positive and significant coefficient for the *PreRel*PostFiling*Sued* interaction term. This finding suggests that lenders are more willing to trust firms that they have an existing relationship.

It should also be noted that the relationship between the various loan characteristics and the *PreRel* variable are consistent with expectations and with those found in the literature (e.g. Petersen and Rajan, 1994; Berger and Udell, 1995; Bharath et al., 2011). Overall, the results appear to be robust using a diff-in-diff-in-diff approach.

[27] It should be noted that for this model dividends were dropped from the model as an independent variable. This is a result of the model not converging when estimated in Stata, however the model does converge when estimated in SAS. Since it was necessary to adjust the interaction terms for the issues pointed out by Ai and Norton (2003) and Karaca-Mandic et al. (2012) it was necessary to estimate the model in Stata.

2.5 Conclusion

This chapter examines whether a firm's relationship with its lenders is adversely impacted by the filing of a SCA. It is found that firms that borrow from a reputable lender are less likely to be sued. This relation does not appear to be a result of reputable lenders providing better oversight to ensure that misconduct does not occur. Rather reputable lenders appear to be better at screening prospective borrowers and are therefore less likely to lend to firms with high litigation risk. These findings suggest that reputable lenders are more likely to be able to avoid firms that end up committing misconduct but are not more capable of stopping its occurrence. This has implications for loan policies of lenders that seek to avoid firms with high litigation risk.

This chapter also presents evidence that, after being sued, firms that did not have an existing relationship with a lender are more likely to borrow from a new lender. Loans initiated after the filing of a SCA are more likely to have larger spreads and shorter in maturities. These findings are consistent with sued firms facing harsher contracting terms as a result of the loss of reputation.

If a firm had a relationship with a lender before the filing, they are more likely to continue borrowing from the same lender. Sued firms with *ex-ante* lending relationships receive more favourable loan terms compared to sued firms without a relationship with a lender. These more lenient loan terms could be a result of lenders having a better understanding of the financial health of firms that they had an existing relationship with. Alternatively, lenders may provide more favourable terms to sued firms with which they have a relationship in an effort to preserve that relationship in the long run.

Overall, shareholder litigation can have a substantial impact on a firm's access to private debt if a firm does not maintain a relationship with its lenders. The filing of a class action appears to damage a firm's reputation, which results in harsher loan terms. However, reputational damage caused by corporate misconduct can be largely offset by having an existing relationship with a lender. Corporate misconduct, therefore, does not appear to undermine a firm's relationship with its providers of financial capital.

Table 2.1: Variable Definitions

Variable	Definition
Panel (A): Lender Related Variables	
PreRel	Dummy variable equal to one if the firm had borrowed from the same lender more than once in the prior five years. Source: Dealscan.
PreReputable	Dummy variable equal to one if the firm had borrowed from a reputable lender in the prior three years. Source: Dealscan.
Panel (B): Loan Characteristics	
Loan Spread	The natural log of the all-in drawn spread, which is defined as the amount the borrower pays in basis points over LIBOR for each dollar drawn down. Source: Dealscan.
Loan Size	Natural log of the loan facility amount. Source: Dealscan.
Loan Maturity	Natural log of the number of months to maturity. Source: Dealscan.
Loan Collateral	Dummy variable equal to one if the loan requires collateral. Source: Dealscan.
Loan Covenants	Number of covenants in the loan contract. Source: Dealscan.
Syndicate Size	The number of participants in the loan syndicate. Source: Dealscan.
Lead Allocation	Percentage of the loan held by the lead arranger. Source: Dealscan.
Panel (C): Other Variables	
PostFiling	A dummy variable equal to one if the loan deal is established after the filing of a class action.
Sued	A dummy variable equal to one if the firm was sued. Source: Stanford Securities Class Action Clearinghouse.
Size	Natural log of the firm's market capitalisation. Source: Compustat.
Leverage	Ratio of total book value of current and long term debt to market capitalisation. Source: Compustat.
ROA	Ratio of net income to assets. Source: Compustat.
Return	Annual return on the firm's stock. Source: CRSP.
B/M	Ratio of common equity to market capitalisation. Source: Compustat.
Tangibles	Ratio of the gross plant property and equipment (PPE) to total assets. Source: Compustat.
Dividends	Ratio of total ordinary share dividends paid to total assets. Source: Compustat.
Term Spread	The difference between the 10 year treasury yield and the 2 year treasury yield. Source: Federal Reserve Board of Governors.
Credit Spread	The difference between BAA corporate bond yield and AAA corporate bond yield. Source: Federal Reserve Board of Governors.
Ind	48 industry dummy variables in accordance with Fama and French (1997). Source: Compustat.
Year	Dummy variables equal to one for a particular year and zero otherwise.

Table 2.2: Comparison of Sued and Non-Sued Firms

Table 2.2 reports descriptive statistics for sued and non-sued firm-year observations between 1996 and 2011. The table includes the mean and number of observations for the selected variables. The means are winsorised at the 1st and 99th percentiles. The difference between the two samples are calculated as the mean of the sued firms variable less the mean of the non-sued firms variable and these are shown in the last column with significance calculated using a paired t-test. Variables definitions can be found in.Table 2.1. *, **, *** Statistically different from zero at the 10, 5 and 1 percent significance levels, respectively.

	Sued		Non-Sued		Difference (Sued-NonSued)
Firm Values					
Market Cap	9,986.47	1,037	2,847.75	36,480	7,138.72***
Assets	25,265.85	1,037	4,950.24	36,480	20,315.61***
Leverage	0.27	1,037	0.29	36,480	-0.02**
ROA	0.00	1,037	0.00	36,480	0.00
Return	0.10	1,037	0.15	36,480	-0.05
B/M	0.64	1,037	1.64	36,480	-1.00
Tangibles	0.37	1,037	0.55	36,480	-0.18***
Dividends	0.01	1,037	0.01	36,480	0.00*
SCA Info					
Settled	0.58	1,037			
Days In CP	420.36	1,037			
Days to File	108.34	1,037			
Days to Outcome	1,225.85	1,037			
Bank Loans					
Reputable Lender (Amount)	0.31	1,037	0.35	36,480	-0.04***
Reputable Lender (Number)	0.25	1,037	0.30	36,480	-0.05***
Loan Spread	191.26	1,331	165.01	30,486	26.25***
Loan Size	922.42	1,605	637.97	36,142	284.45***
Loan Maturity	40.13	1,519	47.59	34,269	-7.46***
Collateral	0.69	885	0.66	21,497	0.03**
Number of Covenants	2.28	700	2.35	17,325	-0.07*
Syndicate Size	11.74	1,605	10.39	36,168	1.35***
Lead Allocation	20.65	473	25.41	11,487	-4.76***

Table 2.3: Distribution of Class Actions Across Time and Industry

Table 2.3 reports the number of SCAs filed each year and in each industry for the sample of 448 class actions filed during the period of 1996 to 2011 obtained from the Stanford SCA Clearinghouse. Panel A displays the number and percentage of SCAs filed each year. Panel B reports the frequency of class actions by industry.

Panel A: Distribution of Sample across Years		
Year	N	Percentage
1996	7	1.6%
1997	16	3.6%
1998	23	5.1%
1999	38	8.5%
2000	33	7.4%
2001	24	5.4%
2002	58	12.9%
2003	41	9.2%
2004	48	10.7%
2005	36	8.0%
2006	21	4.7%
2007	22	4.9%
2008	36	8.0%
2009	24	5.4%
2010	15	3.3%
2011	6	1.3%
Total	448	
Panel B: Distribution of Class Actions across Industries		
Agriculture, Forestry and Fishing	0	0.0%
Mining	13	2.9%
Construction	10	2.2%
Manufacturing	164	36.6%
Transportation	60	13.4%
Wholesale Trade	24	5.4%
Retail Trade	34	7.6%
Finance, Insurance and Real Estate	62	13.8%
Services	80	17.9%
Public Administration	0	0.0%
Other	1	0.2%
Total	448	

Table 2.4: Correlations

Table 2.4 shows the matrix of Spearman correlation coefficients for the independent variables that are analysed in equation (2.2). Correlations are calculated based on the full sample of sued and non-sued firms analysed in equation (2.2). Variance inflation factors (VIFs) are also presented for the independent variables used in equation (2.2). Variables definitions can be found in Table 2.1.

	PostFiling	PreRel	PreReputable (Amount)	Size	Leverage	ROA	Return	B/M	Tangibles	Dividends	VIF
PostFiling	1.00										1.05
PreRel	0.14	1.00									
PreReputable (Amount)	0.04	0.12	1.00								1.09
Size	0.04	0.10	0.90	1.00							2.05
Leverage	0.04	0.20	0.24	0.21	1.00						1.17
ROA	0.01	0.00	0.10	0.09	-0.12	1.00					1.18
Return	-0.04	0.03	-0.02	-0.01	0.20	-0.26	1.00				1.05
B/M	0.03	0.00	0.01	0.01	-0.11	0.02	-0.02	1.00			1.03
Tangibles	0.01	0.00	0.01	0.01	-0.01	0.10	-0.04	0.01	1.00		1.05
Dividends	-0.01	0.07	0.04	0.04	0.25	-0.08	0.20	-0.01	0.16	1.00	1.17

Table 2.5: Impact of Risk of Class Action on Bank Reputation

Table 2.5 reports two stage analysis for the effect of litigation risk on the probability of a loan being obtained from a reputable lender, using equations (2.1) and (2.2). The dependent variable in the first stage (*Sued*) takes a value of one if a class action was filed in a particular year and is equal to zero otherwise. The dependent variable in the second stage is equal to one if a loan is obtained from a reputable lender and is equal to zero otherwise. For *Reputable (Amount)* a lender is deemed to be reputable if the market share based on the amount of money lent exceeds 3%. For *Reputable (Number)* a lender is deemed to be reputable if the market share based on the number of loans provided exceeds 3%. Robust standard errors clustered at the firm level are reported in parentheses. Variable definitions can be found in Table 2.1. *, **, *** Statistically different from zero at the 10, 5 and 1 percent significance levels, respectively.

	First Stage	Second Stage			
	SCA Dummy	Reputable (Amount)		Reputable (Number)	
Predicted P(SCA)		-7.882***	-3.002***	-7.025***	-3.087***
		(0.85)	(0.97)	(0.86)	(0.95)
Size	0.294***	0.357***	0.101***	0.275***	0.059***
	(0.02)	(0.01)	(0.02)	(0.01)	(0.02)
Leverage	0.412***	0.711***	0.156*	0.390***	-0.046
	(0.16)	(0.08)	(0.09)	(0.08)	(0.08)
ROA	-0.123**	0.407***	0.256*	0.334**	0.182
	(0.06)	(0.14)	(0.15)	(0.13)	(0.14)
B/M	-0.019*	0.003***	0.001**	0.002***	0.000
	(0.01)	(0.00)	(0.00)	(0.00)	(0.00)
Tangibles	-1.398***	-0.322***	-0.246***	-0.261***	-0.192***
	(0.15)	(0.05)	(0.06)	(0.05)	(0.06)
Dividends	-2.647*	1.562***	1.174**	1.625***	1.248**
	(1.57)	(0.49)	(0.46)	(0.51)	(0.50)
Loan Size			0.482***		0.401***
			(0.01)		(0.01)
Loan Maturity			-0.010		-0.075***
			(0.02)		(0.02)
Intercept	-5.743***	-1.512***	-8.730***	-1.384***	-7.168***
	(0.29)	(0.14)	(0.27)	(0.13)	(0.25)
Year Fixed Effect	Yes	Yes	Yes	Yes	Yes
Industry Fixed Effect	Yes	Yes	Yes	Yes	Yes
Pseudo R^2	0.02	0.10	0.15	0.06	0.10
N	46542	22926	21345	22926	21345

Table 2.6: Impact of Bank Reputation on Probability of Class Action

Table 2.6 reports logit regression estimates for the effect the reputation of banks have on the probability of a firm being sued, using equation (2.3). The dependent variable in these regressions takes the value of one if a class action was filed in a particular year and is equal to zero otherwise. Robust standard errors clustered at the firm level are reported in parentheses. Variable definitions can be found in Table 2.1. *, **, *** Statistically different from zero at the 10, 5 and 1 percent significance levels, respectively.

	Dependent Variable: Sued	
PreReputable (Amount)	0.096	
	(0.08)	
PreReputable (Number)		0.014
		(0.08)
Size	0.292***	0.286***
	(0.02)	(0.02)
Leverage	0.172	0.153
	(0.14)	(0.14)
ROA	-0.010	-0.017
	(0.07)	(0.07)
Return	-0.030**	-0.030**
	(0.01)	(0.01)
B/M	-0.006**	-0.006**
	(0.00)	(0.00)
Tangibles	-1.353***	-1.353***
	(0.13)	(0.13)
Dividends	-3.204*	-3.238*
	(1.66)	(1.67)
Intercept	-5.581	-5.509
	(6.92)	(6.95)
Year Dummies	Yes	Yes
Industry Dummies	Yes	Yes
Pseudo R^2	0.09	0.09
N	37,517	37,517

Table 2.7: Impact of Class Action on Relationship with Bank

Table 2.7 reports logit regression estimates for the effect the filing of a class action has on whether a loan is obtained from a lender that the firm has a relationship with, using equation (2.4). The dependent variable in these regressions takes the value of one if the loan was obtained from a lender that the firm has previously borrowed from and is equal to zero otherwise. Robust standard errors clustered at the firm level are reported in parentheses. Variable definitions can be found in Table 2.1. *, **, *** Statistically different from zero at the 10, 5 and 1 percent significance levels, respectively.

	Dependent Variable: Relationship with Lender					
	All		Dismissed		Settled	
PostFiling	-0.125	-0.572*	-0.045	0.683	-0.308**	-2.081***
	(0.10)	(0.32)	(0.15)	(0.46)	(0.15)	(0.55)
PreRel		0.901***		1.536***		0.585**
		(0.19)		(0.31)		(0.28)
PreRel * PostFiling		0.102		-0.158*		0.371***
		(0.07)		(0.91)		(0.12)
Size	0.108***	0.085***	0.115**	0.089*	0.104***	0.073*
	(0.03)	(0.03)	(0.04)	(0.05)	(0.04)	(0.04)
Leverage	-0.092	-0.143	-0.179	-0.217	-0.374	-0.458
	(0.25)	(0.26)	(0.41)	(0.41)	(0.38)	(0.39)
ROA	-0.487	-0.413	0.513	0.846	-0.976	-0.937
	(0.36)	(0.35)	(0.77)	(0.78)	(0.61)	(0.61)
B/M	0.008	0.010	-0.006	-0.018	0.018	0.016
	(0.02)	(0.02)	(0.04)	(0.04)	(0.02)	(0.02)
Tangibles	-0.223	-0.222	-0.651**	-0.656**	0.046	0.005
	(0.19)	(0.19)	(0.31)	(0.31)	(0.28)	(0.29)
Dividends	10.211**	9.262**	22.529***	21.654***	-6.720	-8.291
	(4.65)	(4.58)	(7.79)	(7.62)	(7.48)	(7.58)
Term Spread	-0.933	-0.939	-0.600	-0.653	-1.490**	-1.815**
	(12.39)	(12.39)	(8.36)	(8.51)	(0.73)	(0.76)
Credit Spread	7.999	8.105	-0.825	-0.097	32.819**	41.034**
	(29.96)	(29.97)	(20.94)	(21.31)	(15.52)	(16.52)
Intercept	-3.482	-4.077	4.462	2.751	-27.345	-35.148*
	(14.65)	(14.59)	(10.15)	(10.13)	(18.97)	(19.68)
Industry Fixed Effect	Yes	Yes	Yes	Yes	Yes	Yes
Pseudo R^2	0.09	0.09	0.10	0.11	0.09	0.10
N	4,021	4,021	1,899	1,899	2,122	2122

Table 2.8: Summary of Results When Class Action is Settled

Table 2.8 presents a summary of the results of the impact a SCA have on loan characteristics. The dependent variables are one of seven loan characteristics, using equation (2.5). These loan characteristics include loan: spread, size, maturity, collateral, number of covenants, syndicate size and percentage held by the lead arranger. The results reported are for the class actions that were settled. Robust standard errors clustered at the firm level are reported in parentheses. Variable definitions can be found in Table 2.1. *, **, *** Statistically different from zero at the 10, 5 and 1 percent significance levels, respectively.

	Reduced Model		Diff-in-Diff Model				
Dependent Variable	Expected PostFiling	PostFiling	Expected PostFiling	PostFiling	PreRel	Expected PreRel*PostFiling	PreRel*PostFiling
Loan Spread	+	0.302***	+	0.885***	0.016	-	-0.596***
		(0.04)		(0.16)	(0.07)		(0.16)
Loan Size	-	0.092	-	-0.362	0.240**	+	0.443*
		(0.07)		(0.24)	(0.12)		(0.25)
Loan Maturity	-	-0.089**	-	-0.119	0.145*	+	0.018
		(0.04)		(0.16)	(0.09)		(0.16)
Loan Collateral	+	0.346	+	0.424	-0.344	-	-0.003
		(0.21)		(1.29)	(0.43)		(0.15)
Loan Covenants	+	-0.007	+	-0.188	0.035	-	0.180
		(0.05)		(0.26)	(0.10)		(0.26)
Syndicate Size	-	-0.050	-	-0.229	0.125*	+	0.172
		(0.05)		(0.21)	(0.08)		(0.21)
Lead Allocation	+	0.026	+	-0.088	-0.042*	-	0.118
		(0.02)		(0.12)	(0.04)		(0.12)

Table 2.9: Impact a Relationship with a Bank has on Loan Spread

Table 2.9 reports OLS regression estimates for the effect the filing of a class action has on loan spread, using equation (2.5). The dependent variable in these regressions is the natural log of the all-in drawn spread. Robust standard errors clustered at the firm level are reported in parentheses. Variable definitions can be found in Table 2.1. *, **, *** Statistically different from zero at the 10, 5 and 1 percent significance levels, respectively.

	Loan Spread					
	All		Dismissed		Settled	
PostFiling	0.209***	0.369***	0.132***	-0.014	0.302***	0.885***
	(0.03)	(0.10)	(0.04)	(0.11)	(0.04)	(0.16)
PreRel		0.014		0.014		0.016
		(0.05)		(0.07)		(0.07)
PreRel * PostFiling		-0.165		0.154		-0.596***
		(0.10)		(0.11)		(0.16)
Size	-0.296***	-0.296***	-0.330***	-0.332***	-0.251***	-0.249***
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
Leverage	0.861***	0.865***	0.851***	0.849***	0.736***	0.755***
	(0.08)	(0.08)	(0.12)	(0.12)	(0.09)	(0.09)
ROA	0.155	0.154	-0.506**	-0.479*	0.244***	0.252***
	(0.10)	(0.10)	(0.25)	(0.25)	(0.08)	(0.08)
B/M	-0.052***	-0.052***	-0.093***	-0.094***	-0.044***	-0.043***
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
Tangibles	-0.245***	-0.244***	-0.052	-0.051	-0.219***	-0.218***
	(0.05)	(0.05)	(0.09)	(0.09)	(0.06)	(0.06)
Dividends	-5.388***	-5.373***	-3.400**	-3.408**	-13.630***	-13.603***
	(2.04)	(2.04)	(1.71)	(1.71)	(1.44)	(1.43)
Term Spread	0.137	0.155	0.645**	0.626**	-0.923**	-0.848**
	(0.24)	(0.24)	(0.27)	(0.27)	(0.45)	(0.41)
Credit Spread	0.604	0.612	1.842**	1.774*	-0.589	-1.336
	(0.84)	(0.84)	(0.91)	(0.91)	(1.60)	(1.56)
Intercept	6.651***	6.575***	4.598***	4.716***	9.669***	10.193***
	(1.32)	(1.32)	(1.46)	(1.46)	(2.50)	(2.48)
Industry Fixed Effect	Yes	Yes	Yes	Yes	Yes	Yes
Year Fixed Effect	Yes	Yes	Yes	Yes	Yes	Yes
R^2	0.58	0.58	0.60	0.60	0.62	0.62
N	3,191	3,191	1,452	1,452	1,739	1,739

Table 2.10: Impact a Relationship with a Bank has on Loan Size

Table 2.10 reports OLS regression estimates for the effect the filing of a class action has on loan size, using equation (2.5). The dependent variable in these regressions is the natural log of the size of the loan. Robust standard errors clustered at the firm level are reported in parentheses. Variable definitions can be found in Table 2.1. *, **, *** Statistically different from zero at the 10, 5 and 1 percent significance levels, respectively.

	Loan Size					
	All		Dismissed		Settled	
PostFiling	0.129***	0.050	0.076	0.068	0.092	-0.362
	(0.05)	(0.14)	(0.06)	(0.19)	(0.07)	(0.24)
PreRel		0.286***		0.228*		0.240**
		(0.09)		(0.14)		(0.12)
PreRel * PostFiling		0.067		0.003		0.443*
		(0.14)		(0.20)		(0.25)
Size	0.368***	0.362***	0.409***	0.403***	0.379***	0.370***
	(0.01)	(0.01)	(0.02)	(0.02)	(0.02)	(0.02)
Leverage	0.170	0.164	0.106	0.105	0.268	0.257
	(0.12)	(0.12)	(0.17)	(0.17)	(0.18)	(0.17)
ROA	-0.109	-0.099	-0.274	-0.212	-0.139	-0.138
	(0.13)	(0.13)	(0.33)	(0.34)	(0.15)	(0.15)
B/M	0.072***	0.072***	0.072***	0.069***	0.063***	0.064***
	(0.01)	(0.01)	(0.02)	(0.02)	(0.01)	(0.01)
Tangibles	0.254***	0.254***	0.233*	0.235*	0.160	0.150
	(0.09)	(0.09)	(0.13)	(0.13)	(0.12)	(0.12)
Dividends	4.273***	4.198***	0.383	0.377	13.599***	13.382***
	(1.35)	(1.34)	(0.72)	(0.72)	(3.15)	(3.15)
Term Spread	0.597	0.572	0.026	0.018	2.290***	2.154***
	(0.37)	(0.37)	(0.41)	(0.41)	(0.74)	(0.76)
Credit Spread	1.407	1.402	0.677	0.631	2.084	2.776
	(1.39)	(1.38)	(1.50)	(1.50)	(2.98)	(3.01)
Intercept	13.721***	13.622***	15.541***	15.467***	9.178*	8.740*
	(2.19)	(2.18)	(2.39)	(2.39)	(4.72)	(4.67)
Industry Fixed Effect	Yes	Yes	Yes	Yes	Yes	Yes
Year Fixed Effect	Yes	Yes	Yes	Yes	Yes	Yes
R^2	0.27	0.27	0.36	0.36	0.29	0.30
N	4,019	4,019	1,898	1,898	2,121	2,121

Table 2.11: Impact a Relationship with a Bank has on Loan Maturity

Table 2.11 reports OLS regression estimates for the effect the filing of a class action has on loan maturity, using equation (2.5). The dependent variable in these regressions is the natural log of the number of months until maturity of the loan. Robust standard errors clustered at the firm level are reported in parentheses. Variable definitions can be found in Table 2.1. *, **, *** Statistically different from zero at the 10, 5 and 1 percent significance levels, respectively.

	Loan Maturity					
	All		Dismissed		Settled	
PostFiling	-0.080***	-0.079	-0.036	-0.011	-0.089**	-0.119
	(0.03)	(0.10)	(0.04)	(0.12)	(0.04)	(0.16)
PreRel		0.092		0.024		0.145*
		(0.06)		(0.09)		(0.09)
PreRel * PostFiling		-0.006		-0.026		0.018
		(0.10)		(0.13)		(0.16)
Size	-0.087***	-0.089***	-0.111***	-0.111***	-0.074***	-0.079***
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
Leverage	0.563***	0.562***	0.494***	0.494***	0.697***	0.699***
	(0.07)	(0.07)	(0.11)	(0.11)	(0.10)	(0.10)
ROA	0.377***	0.378***	0.694***	0.695***	0.327***	0.329***
	(0.08)	(0.08)	(0.21)	(0.21)	(0.09)	(0.09)
B/M	-0.008	-0.008	0.007	0.007	-0.008	-0.008
	(0.01)	(0.01)	(0.02)	(0.02)	(0.01)	(0.01)
Tangibles	-0.020	-0.020	0.020	0.020	-0.031	-0.034
	(0.05)	(0.05)	(0.09)	(0.09)	(0.07)	(0.07)
Dividends	-2.275**	-2.288**	-1.553*	-1.552*	-3.055	-3.148
	(0.89)	(0.89)	(0.84)	(0.84)	(1.93)	(1.93)
Term Spread	-0.323*	-0.328**	-0.285	-0.283	-0.134	-0.160
	(0.17)	(0.17)	(0.19)	(0.19)	(0.32)	(0.34)
Credit Spread	-1.562**	-1.562**	-1.807**	-1.803**	-2.019*	-1.863
	(0.62)	(0.62)	(0.77)	(0.77)	(1.13)	(1.17)
Intercept	7.057***	7.012***	7.571***	7.546***	6.558***	6.378***
	(1.00)	(1.00)	(1.22)	(1.23)	(1.81)	(1.82)
Industry Fixed Effect	Yes	Yes	Yes	Yes	Yes	Yes
Year Fixed Effect	Yes	Yes	Yes	Yes	Yes	Yes
R^2	0.22	0.22	0.26	0.26	0.22	0.22
N	3,792	3,792	1,817	1,817	1,975	1,975

Table 2.12: Impact a Relationship with a Bank has on Loan Collateral

Table 2.12 reports logit regression estimates for the effect the filing of a class action has on loan collateral, using equation (2.5). The dependent variable in these regressions takes the value of one if the loan requires collateral and is equal to zero otherwise. Robust standard errors clustered at the firm level are reported in parentheses. Variable definitions can be found in Table 2.1. *, **, *** Statistically different from zero at the 10, 5 and 1 percent significance levels, respectively.

	Loan Collateral					
	All		Dismissed		Settled	
PostFiling	0.160	0.065	0.149	0.178	0.346	0.424
	(0.14)	(0.57)	(0.22)	(0.84)	(0.21)	(1.29)
PreRel		0.172		1.206**		-0.344
		(0.30)		(0.55)		(0.43)
PreRel * PostFiling		0.012		-0.007		-0.003
		(0.08)		(0.11)		(0.15)
Size	-0.888***	-0.892***	-0.895**	-0.926***	-0.926***	-0.918***
	(0.05)	(0.05)	(0.08)	(0.08)	(0.07)	(0.07)
Leverage	3.293***	3.287***	2.528***	2.494***	4.312***	4.335***
	(0.40)	(0.40)	(0.61)	(0.61)	(0.66)	(0.66)
ROA	-0.570	-0.576	0.586	0.364	-0.701	-0.756
	(0.82)	(0.82)	(1.38)	(1.40)	(1.20)	(1.21)
B/M	-0.100**	-0.099**	0.032	-0.008	-0.129**	-0.134**
	(0.05)	(0.05)	(0.12)	(0.12)	(0.05)	(0.06)
Tangibles	-0.592**	-0.598**	0.675	0.655	-1.223***	-1.226***
	(0.29)	(0.29)	(0.46)	(0.47)	(0.43)	(0.43)
Dividends	-34.415***	-34.197***	-35.514***	-32.092***	-60.794***	-60.238***
	(7.18)	(7.16)	(9.53)	(9.78)	(14.08)	(14.09)
Term Spread	-0.344	-0.353	0.475	0.611	-8.210	-8.253
	(0.99)	(0.99)	(1.23)	(1.25)	(122.08)	(122.87)
Credit Spread	-2.214	-2.284	-3.346	-2.993	15.281	14.985
	(3.78)	(3.79)	(4.78)	(4.81)	(290.01)	(291.88)
Intercept	10.545	10.534	9.474	7.929	11.372	11.995
	(26.86)	(26.84)	(24.73)	(24.47)	(29.99)	(30.04)
Industry Fixed Effect	Yes	Yes	Yes	Yes	Yes	Yes
Year Fixed Effect	Yes	Yes	Yes	Yes	Yes	Yes
Pseudo R^2	0.38	0.38	0.41	0.42	0.44	0.44
N	2,156	2,156	961	961	1,195	1,195

Table 2.13: Impact a Relationship with a Bank has on Loan Covenants

Table 2.13 reports poisson regression estimates for the effect the filing of a class action has on loan covenants, using equation (2.5). The dependent variable in these regressions is the number of covenants in the loan contract. Robust standard errors clustered at the firm level are reported in parentheses. Variable definitions can be found in Table 2.1. *, **, *** Statistically different from zero at the 10, 5 and 1 percent significance levels, respectively.

	Number of Covenants					
	All		Dismissed		Settled	
PostFiling	-0.009	-0.025	-0.036	0.053	-0.007	-0.188
	(0.04)	(0.14)	(0.06)	(0.18)	(0.05)	(0.26)
PreRel		0.092		0.197*		0.035
		(0.07)		(0.11)		(0.10)
PreRel * PostFiling		0.006		-0.110		0.180
		(0.14)		(0.19)		(0.26)
Size	-0.121***	-0.124***	-0.138***	-0.140***	-0.096***	-0.098***
	(0.01)	(0.01)	(0.02)	(0.02)	(0.02)	(0.02)
Leverage	0.203**	0.200**	0.129	0.124	0.294**	0.284**
	(0.10)	(0.10)	(0.16)	(0.16)	(0.14)	(0.14)
ROA	0.009*	0.004*	-0.026	-0.031	0.020	0.013
	(0.09)	(0.09)	(0.29)	(0.30)	(0.10)	(0.10)
B/M	-0.043***	-0.043***	-0.046	-0.045	-0.044**	-0.044**
	(0.01)	(0.01)	(0.03)	(0.03)	(0.02)	(0.02)
Tangibles	-0.176***	-0.178***	-0.087	-0.081	-0.201**	-0.207**
	(0.07)	(0.07)	(0.11)	(0.11)	(0.10)	(0.10)
Dividends	-1.478	-1.469	-0.957	-0.934	-5.274*	-5.265*
	(1.04)	(1.04)	(1.07)	(1.07)	(3.14)	(3.15)
Term Spread	0.314	0.317	0.422	0.460	0.296	0.279
	(0.32)	(0.32)	(0.40)	(0.40)	(0.60)	(0.60)
Credit Spread	-0.032	-0.010	-0.234	-0.196	1.272	1.534
	(1.28)	(1.28)	(1.52)	(1.52)	(2.63)	(2.64)
Intercept	1.007	0.941	1.149	0.922	-0.756	-0.963
	(1.98)	(1.98)	(2.34)	(2.34)	(4.06)	(4.06)
Industry Fixed Effect	Yes	Yes	Yes	Yes	Yes	Yes
Year Fixed Effect	Yes	Yes	Yes	Yes	Yes	Yes
Pseudo R^2	0.39	0.39	0.52	0.53	0.36	0.37
N	1,714	1,714	767	767	947	947

Table 2.14: Impact a Relationship with a Bank has on Syndicate Size

Table 2.14 reports negative binomial regression estimates for the effect the filing of a class action has on syndicate size, using equation (2.5). The dependent variable in these regressions is the number of participants in the loan syndicate. Robust standard errors clustered at the firm level are reported in parentheses. Variable definitions can be found in Table 2.1. *, **, *** Statistically different from zero at the 10, 5 and 1 percent significance levels, respectively.

	Syndicate Size					
	All		Dismissed		Settled	
PostFiling	0.009	-0.131	0.095	-0.022	-0.050	-0.229
	(0.03)	(0.14)	(0.05)	(0.19)	(0.05)	(0.21)
PreRel		0.128		0.037		0.125
		(0.07)		(0.12)		(0.10)
PreRel * PostFiling		0.138		0.121		0.172
		(0.14)		(0.19)		(0.21)
Size	0.191***	0.187***	0.184***	0.181***	0.200***	0.195***
	(0.01)	(0.01)	(0.01)	(0.02)	(0.01)	(0.01)
Leverage	0.108*	0.105*	-0.110	-0.110	0.189	0.187
	(0.09)	(0.09)	(0.13)	(0.13)	(0.12)	(0.12)
ROA	-0.202**	-0.199**	-0.028	-0.009	-0.225*	-0.224*
	(0.10)	(0.10)	(0.29)	(0.29)	(0.12)	(0.12)
B/M	0.021***	0.021***	0.006	0.005	0.020***	0.020***
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
Tangibles	0.163**	0.162**	0.000	-0.001	0.130	0.128
	(0.07)	(0.07)	(0.11)	(0.11)	(0.09)	(0.09)
Dividends	0.901	0.816	0.534	0.525	1.095	0.822
	(0.83)	(0.82)	(0.88)	(0.87)	(2.04)	(2.04)
Term Spread	0.538**	0.522**	0.521*	0.506	1.020**	0.973*
	(0.26)	(0.26)	(0.31)	(0.31)	(0.51)	(0.52)
Credit Spread	2.157**	2.155**	2.925**	2.890**	-0.146	0.117
	(1.03)	(1.03)	(1.20)	(1.20)	(1.91)	(1.92)
Intercept	-3.080*	-3.112*	-3.905**	-3.845**	-1.504	-1.730
	(1.61)	(1.61)	(1.89)	(1.90)	(2.88)	(2.88)
Industry Fixed Effect	Yes	Yes	Yes	Yes	Yes	Yes
Year Fixed Effect	Yes	Yes	Yes	Yes	Yes	Yes
Pseudo R^2	0.12	0.12	0.13	0.13	0.16	0.17
N	4,021	4,021	1,899	1,899	2,122	2,122

Table 2.15: Impact a Relationship with a Bank has on Lead Allocation

Table 2.15 reports Tobit regression estimates for the effect the filing of a class action has on lead allocation, using equation (2.5). The dependent variable in these regressions is the percentage of the loan retained by the lead arranger. Robust standard errors clustered at the firm level are reported in parentheses. Variable definitions can be found in Table 2.1. *, **, *** Statistically different from zero at the 10, 5 and 1 percent significance levels, respectively.

	Lead Allocation					
	All		Dismissed		Settled	
PostFiling	0.026*	0.020	0.030*	0.147	0.026	-0.088
	(0.02)	(0.07)	(0.02)	(0.10)	(0.02)	(0.12)
PreRel		-0.017		0.028		-0.042*
		(0.03)		(0.06)		(0.04)
PreRel * PostFiling		0.006		-0.123		0.118
		(0.07)		(0.10)		(0.12)
Size	-0.053***	-0.053***	-0.060***	-0.059***	-0.047***	-0.047***
	(0.00)	(0.00)	(0.01)	(0.01)	(0.01)	(0.01)
Leverage	0.121***	0.122***	0.176**	0.171**	0.125*	0.122*
	(0.04)	(0.04)	(0.07)	(0.07)	(0.06)	(0.06)
ROA	0.032	0.030	-0.118	-0.124	0.074	0.074
	(0.06)	(0.06)	(0.11)	(0.11)	(0.06)	(0.06)
B/M	-0.009***	-0.009***	-0.015	-0.014	-0.010***	-0.010***
	(0.00)	(0.00)	(0.01)	(0.01)	(0.00)	(0.00)
Tangibles	-0.066**	-0.067**	-0.005	-0.002	-0.012	-0.008
	(0.03)	(0.03)	(0.06)	(0.06)	(0.04)	(0.04)
Dividends	-0.453	-0.454	-0.226	-0.240	0.747	0.636
	(0.37)	(0.37)	(0.45)	(0.45)	(1.08)	(1.08)
Term Spread	-0.069	-0.068	-0.038	-0.034	-0.391**	-0.422**
	(0.11)	(0.11)	(0.14)	(0.14)	(0.18)	(0.19)
Credit Spread	-0.384	-0.380	-0.463	-0.408	-0.981	-0.906
	(0.48)	(0.48)	(0.62)	(0.62)	(0.79)	(0.79)
Intercept	1.269*	1.277*	1.249	1.147	2.620**	2.648**
	(0.75)	(0.75)	(0.96)	(0.97)	(1.19)	(1.19)
Industry Fixed Effect	Yes	Yes	Yes	Yes	Yes	Yes
Year Fixed Effect	Yes	Yes	Yes	Yes	Yes	Yes
Pseudo R^2	0.22	0.22	0.30	0.30	0.31	0.31
N	1,116	1,116	510	510	606	606

Table 2.16: Impact of Class Action on Relationship with Lender – Diff-in-Diff-in-Diff

Table 2.16 reports logit regression estimates for the effect the filing of a class action has on whether a loan is obtained from a lender that the firm has a relationship with, using equation (2.6). The dependent variable in these regressions takes the value of one if the loan was obtained from a lender that the firm has previously borrowed from and is equal to zero otherwise. Robust standard errors clustered at the firm level are reported in parentheses. Variable definitions can be found in Table 2.1. *, **, *** Statistically different from zero at the 10, 5 and 1 percent significance levels, respectively.

	Dependent Variable: Relationship with Lender					
	All		Dismissed		Settled	
Sued	0.044	-0.135	-0.126	-0.624**	0.196**	0.266
	(0.06)	(0.17)	(0.09)	(0.26)	(0.09)	(0.24)
PostFiling	0.034	-0.429***	-0.010	-0.255*	0.077	-0.557***
	(0.03)	(0.10)	(0.05)	(0.15)	(0.05)	(0.14)
PreRel		0.498***		0.607***		0.409***
		(0.06)		(0.09)		(0.09)
PostFiling * Sued	-0.027*	-0.031**	-0.020	-0.021	-0.034**	-0.044**
	(0.09)	(0.01)	(0.13)	(0.02)	(0.13)	(0.02)
PreRel * Sued		0.061		0.055		0.104*
		(0.04)		(0.05)		(0.26)
PreRel * PostFiling		0.098***		0.041		0.155***
		(0.02)		(0.03)		(0.03)
PreRel * PostFiling * Sued		0.074		-0.088		0.245**
		(0.07)		(0.10)		(0.11)
Size	0.138***	0.114***	0.141***	0.113***	0.140***	0.119***
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
Leverage	0.177**	0.141*	0.463***	0.428***	-0.033	-0.064
	(0.08)	(0.08)	(0.13)	(0.13)	(0.11)	(0.11)
ROA	0.518***	0.575***	0.930***	1.004***	0.356**	0.406**
	(0.15)	(0.15)	(0.27)	(0.27)	(0.18)	(0.18)
B/M	0.003*	0.002	0.004	0.003	0.002	0.002
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Tangibles	-0.220***	-0.217***	-0.134	-0.127	-0.286***	-0.293***
	(0.06)	(0.06)	(0.10)	(0.10)	(0.08)	(0.08)
Dividends	11.208***	10.578***	11.649***	11.076***	10.662***	10.061***
	(1.30)	(1.30)	(1.88)	(1.88)	(1.81)	(1.80)
Term Spread	0.857***	0.885***	1.137***	1.157***	0.091	0.066
	(0.20)	(0.20)	(0.26)	(0.26)	(3.59)	(3.59)
Credit Spread	-8.017***	-8.279***	-10.785***	-11.161***	-2.927	-2.232
	(2.51)	(2.53)	(3.19)	(3.20)	(9.43)	(9.46)
Intercept	7.618***	7.615***	9.562***	9.618***	4.245	3.443
	(2.92)	(2.93)	(2.83)	(2.84)	(8.89)	(8.91)
Year Fixed Effect	Yes	Yes	Yes	Yes	Yes	Yes
Industry Fixed Effect	Yes	Yes	Yes	Yes	Yes	Yes
Pseudo R^2	0.04	0.05	0.05	0.06	0.04	0.05
N	33,444	33,444	16,100	16,100	17,344	17,344

Table 2.17: Summary of Results When Class Action is Settled – Diff-in-Diff-in-Diff

Table 2.17 presents a summary of the results of the impact a SCA have on loan characteristics. The dependent variables are one of seven loan characteristics, using equation (2.7). These loan characteristics include loan: spread, size, maturity, collateral, number of covenants, syndicate size and percentage held by the lead arranger. The results reported are for the class actions that were settled. Robust standard errors clustered at the firm level are reported in parentheses. Variable definitions can be found in Table 2.1. *, **, *** Statistically different from zero at the 10, 5 and 1 percent significance levels, respectively.

Dependent Variable	Sued (A)	PostFiling (B)	PreRel (C)	Expected PostFiling * Sued	PostFiling * Sued (D)	PreRel*Sued (E)	PreRel*PostFiling (F)	Expected PreRel * PostFiling * Sued	PreRel * Post-Filing * Sued (G)
Loan Spread	-0.078	-0.054	-0.127***	+	0.727***	0.226***	0.079*	-	-0.588***
	(0.08)	(0.04)	(0.03)		(0.16)	(0.08)	(0.04)		(0.16)
Loan Size	-0.009	-0.123	-0.026	-	-0.200	-0.154	0.157**	+	0.302
	(0.11)	(0.08)	(0.04)		(0.22)	(0.12)	(0.08)		(0.23)
Loan Maturity	-0.107	-0.121**	-0.044	-	-0.009	0.187**	0.144***	+	-0.080
	(0.08)	(0.05)	(0.03)		(0.14)	(0.09)	(0.05)		(0.15)
Loan Collateral	-0.026	-0.433*	-0.352**	+	0.057	-0.128	0.049	-	-0.291**
	(0.94)	(0.05)	(0.01)		(0.04)	(0.08)	(0.05)		(0.12)
Loan Covenants	0.007	-0.045	0.000	+	-0.060	0.053	0.047	-	0.006
	(0.94)	(0.42)	(1.00)		(0.79)	(0.60)	(0.42)		(0.98)
Syndicate Size	0.078	0.137***	0.082**	-	-0.591***	-0.005	-0.117**	+	0.448**
	(0.37)	(0.01)	(0.01)		(0.00)	(0.96)	(0.03)		(0.02)
Lead Allocation	-0.099**	0.004	-0.076***	+	0.117	0.073*	-0.012	-	-0.038
	(0.02)	(0.87)	(0.00)		(0.26)	(0.09)	(0.65)		(0.71)

Chapter 3

Political Lobbying and Securities Class Actions

3.1 Introduction

Corporations play an important role in the political process through lobbying. Firms that lobby extensively can gain access and influence the policy-making process, giving them additional and, some may argue, undue power. Further, this influence is likely to extend well beyond the political landscape. Economic agents may be unwilling to oppose these powerful firms for fear of repercussions (i.e. coercive power) or as a result of their 'soft power' which alters the preferences of economic agents in the interest of the firm through appeal and attraction.[28] This chapter examines whether tacit power, be it coercive or soft in nature, signalled by lobbying is related to the time it takes to uncover violation of securities laws before and after the enactment of the Sarbanes-Oxley Act (SOX).

Various economic agents are responsible for revealing corporate misconduct. Fraud-detecting agents include analysts, auditors and employees (Dyck et al., 2010). These agents face retaliatory consequences if they try to reveal illegal corporate activities or may be swayed by soft power into believing these powerful lobbying firms are unlikely to commit fraud. A good example of both tacit coercive and tacit soft power is Enron, which

[28] The concept of soft power has been used in the international relations literature (Nye, 1990) for some time, but a derivative of it has recently been used in the corporate finance context by Khanna et al. (2015), who discuss the 'soft influence' of CEOs and its role in facilitating fraud.

spent millions on lobbying and was a very politically influential company. Soft power may have led analysts and auditors to be less suspicious about Enron's activities since prior to its fall from grace, it was seen as a leading innovator, as exemplified by six consecutive awards between 1996 and 2001 from *Forbes* as the 'Most Innovative Company in America'. Furthermore, consistent with the notion of soft power, Enron experienced very little negativity before declaring bankruptcy. One exception that also serves an example of coercive tacit power is the case of John Olson, an outspoken Merrill Lynch analyst. Olson was critical of Enron and was replaced after giving Enron a "neutral" rating. Olson's replacement upgraded the Enron rating in an alleged effort to win more investment banking business (Oppel, 2002). While Enron did not directly influence the decision to replace John Olson, his dismissal was allegedly made to appease manager dissatisfaction. The Enron case characterises how high tacit power, as reflected in lobbying activity, can influence economic agents' behaviour. Economic agents will not be as willing or as likely to voluntarily investigate potential corrupt corporate activities in firms with high tacit power, thereby perpetuating managerial misconduct.

The expectation that corporate fraud and lobbying are positively associated is confirmed in a study by Yu and Yu (2011). They find that lobbying firms commit fraud for 117 days longer. The association found by Yu and Yu (2011) between lobbying and the length of the class period has gained considerable traction in the financial press (The Economist, 2015) and popular business books (Drutman, 2015). Yet it is unclear whether this relationship still holds following efforts to clean up corporate America after a host of corporate scandals around the turn of the century.[29] Most prominently, SOX was enacted in response to these high-profile cases of fraud and misconduct that came to light during 2001 and 2002. The bill was produced to combat fraud by improving accountability and overall accounting quality. SOX also likely impacts the amount of tacit power held by lobbying firms. SOX introduced severe penalties to top executives if evidence of fraudulent activity is discovered. By design, these penalties make managers more accountable, reducing the incentive to commit fraud as well as curbing unethical managerial behaviour. SOX also improved the incentives and ability for auditors, employees and the Securities and Exchange Commission (SEC) to reveal corporate misconduct. These changes encourage agents to reveal evidence of corrupt corporate activities within firms generally but their effect is likely more pronounced in the cases of

[29] The most notable of these scandals were the discovery of the fraud committed by Enron and WorldCom.

firms with high tacit power (i.e. the measures mitigated the tacit power of lobbying firms in particular).

This chapter examines whether lobbying is related to the time it takes to uncover managerial misconduct before and after the implementation of SOX. First, the length of the period investors claim the alleged misconduct took place is analysed. Second, this chapter investigates the impact of lobbying on the probability of a case being settled for the pre- and post-SOX periods. Finally, the extent of the damages caused by the managerial malfeasance is examined in relation to the firms' lobbying activities by looking at the losses investors accrued and the size of the settlement both before and after SOX.

To summarise, this chapter addresses the following research questions:

1) Are firms that lobby able to get away with their misconduct for longer?
2) Are firms that lobby more likely to settle a SCA?
3) Do lobbying firms that are sued cause more damage and face greater reputational penalties?

In doing so, it extends the study by Yu and Yu (2011) that analyses whether lobbying affects the time it takes to detect fraud for a sample period from 1998 to 2004. This chapter makes several contributions to the existing literature. First, it shows that after 2004, lobbying firms are not able to get away with their misconduct for longer. Second, it helps to explain Yu and Yu's (2011) findings by clearly articulating reasons as to why lobbying firms were able to evade detection for longer before 2004. Third, it analyses the impact of political connections on the probability of a settlement and the damages that managers subject to SCAs have caused. Finally, this study provides insight into the impact SOX has had on the discovery of corporate misconduct. The empirical analysis indicates that SOX has had a positive impact on uncovering misconduct for firms that lobby.

A summary of the empirical results are as follows. Up to 2004, lobbying is positively related to class period length and has a marginally negative effect on the probability of a case being settled. These results are consistent with managers of lobbying firms being able to get away with their misconduct for longer and being less likely to have to settle a class action filed against them. The most likely reason for these findings is the tacit power wielded by the lobbying firms, making economic agents unwilling to speak out against them. As a result, it is more difficult to detect and obtain proof that managers have violated securities laws.

From 2005 onwards, no evidence is found to suggest that lobbying is related to the length of the class period or the probability of the class action being settled. This is most probably due to the enactment of SOX. As a result of the new regulatory controls, the tacit power of lobbying firms has decreased, thereby improving the incentives for economic agents to reveal corporate misconduct.

Overall, the results suggest that prior to SOX, lobbying firms held a substantial amount of tacit power that hindered the process through which managerial misconduct is revealed. SOX appears to have reduced the tacit power of lobbying firms and improved the incentives for economic agents to reveal corporate misconduct. As such, SOX appears to have improved the discovery of corporate malfeasance, making it more difficult for powerful firms to get away with breaking the law.

The remainder of this chapter is organised as follows. Section 3.2 provides an overview of the existing literature and develops three hypotheses for this chapter. Section 3.3 provides an overview of the method and data employed. Section 3.4 presents and discusses the empirical results. Section 3.5 contains the concluding remarks.

3.2 Hypothesis Development

Various economic agents can uncover corporate misconduct. Dyck et al. (2010) perform an in-depth analysis of the different incentives and potential conflicts that these agents face. The agents identified by Dyck et al. (2010) include analysts, the media, employees, auditors and the SEC.

Lobbying is typically targeted at government entities or politicians. It is unlikely to directly impact any of the fraud-detecting agents identified by Dyck et al. (2010), with the possible exception of the SEC. The literature suggests that politically connected firms may be able to influence political decisions (see Duchin and Sosyura, 2012; Goldman et al., 2013; Blau et al., 2013) and in so doing wield a substantial amount of tacit power. The influence and power imbalance between politically connected firms and fraud-detecting agents discourages action that opposes these firms for fear of potential repercussions. Each of the key agents identified by Dyck et al. (2010) faces substantial disincentives against revealing corporate misconduct. The repercussions are likely to be worse for more influential firms.

Analysts and journalists face the threat of job loss if their accusations of corporate misconduct conflict with their employers. Analysts may be less likely to bring misconduct to light if it interferes with the investment banking services offered by the analyst's company (Michaely and Womack, 1999). For example, John Olson, who was an analyst of Enron, said, "There was a strong mandate, unwritten, unspoken, at Enron that if you the investment banking house ever wanted to do business with Enron, your analyst had to have a strong buy on the stock" (Schwartz, 2002). Analysts' incentives to reveal misconduct may also be affected by their tendency to herd. In effect, analysts "share the blame" facing lower penalties if they are not the only one making an incorrect recommendation (Scharfstein and Stein, 1990).

Journalists may face similar pressure to not reveal misconduct for fear that it could alienate potential or actual advertisers. For example, Enron tried to influence the media before a negative article was published about them. Enron put a substantial amount of pressure on the editors of *Fortune* by flying three executives to New York in an effort to convince them not to publish the critical article (Barringer, 2002). These instances highlight how analysts and journalists can face significant pressures when attempting to reveal corporate misconduct.

Dyck et al. (2010) find that the most successful analysts and journalists that are employed by the more prestigious media outlets are more likely to be whistle-blowers. It seems that only the most powerful and successful members of the media or analysts bring misconduct to light. This suggests that the potential repercussions faced by most analysts and journalists outweigh the incentives to blow the whistle. This would also suggest that the more powerful a firm is, the greater the disincentives to reveal corporate misconduct. Since lobbying firms are more likely to wield greater tacit power, analysts and journalists may be less willing to accuse lobbying firms of wrongdoing for fear of more severe repercussions.

Employee whistle-blowers also face significant repercussions after they reveal corporate misconduct. Dyck et al. (2010) find that the majority of employee whistle-blowers subsequently lost their jobs, and many faced harassment which forced them to move industry and often move to another town. As such, employee whistle-blowers face severe penalties for revealing misconduct. The harassment that employee whistle-blowers face is likely to be greater for larger and more powerful firms because the accusation of misconduct is likely to adversely affect more people. Typically, lobbying firms are very

large, and as such the harassment faced by employee whistle-blowers is likely to be more substantial.

Auditors should play an important role in the revelation of fraud because of their access to internal and external information. However, they may be hesitant to reveal evidence of fraudulent activities for fear of losing business. This fear is likely to be worse for lobbying firms, since they are typically larger in size and account for a substantial amount of business. Before the implementation of SOX, the firm's management typically appointed auditors as opposed to an independent audit committee. Auditors, therefore, lacked independence and may have been friendlier to maintain loyalty with the firm's management.

The SEC is one of the few fraud-detecting agents identified by Dyck et al. (2010) that could be directly affected by lobbying activities. Consistent with lobbying being able to influence the SEC, Correia (2014) finds that politically connected firms face fewer SEC enforcement actions and lower penalties. They also report lower potential enforcement costs when lobbyists have an SEC employment history and the SEC is lobbied directly. Similarly, Fulmer et al. (2012) find that CEOs receive less severe penalties from the SEC if they make political contributions. These results suggest that lobbying may negatively impact the effectiveness of the SEC as a regulatory entity.

Overall, agents that blow the whistle on corporate misconduct face severe disincentives, which are likely to be worse for politically influential companies. Alternatively, agents may be unwilling to reveal misconduct as a result of lobbying firms' soft power. Soft power alters the preferences of economic agents in the interest of the firm through appeal and attraction. As a result, lobbying firms may be able to get away with their misconduct for longer because the fraud-detecting agents are less willing to bring misconduct to light. Consistent with this expectation, Yu and Yu (2011) find that fraudulent firms that lobby evade detection for 117 days longer than non-lobbying firms. This leads to Hypothesis 1a.

Hypothesis 1a: Lobbying allows firms to conceal their misconduct longer before SOX.

The Sarbanes-Oxley Act of 2002 was the legislative response to the numerous high-profile cases of fraud and misconduct that came to light in late 2001 and early 2002. The bill was aimed at improving overall accounting quality and accountability. SOX introduced numerous requirements targeted at disincentivising fraud, and these

requirements have likely impacted the tacit power of all firms but in particular the tacit power of firms with the most influence, namely lobbying firms.

Under the new SOX requirements, the CEO and CFO must certify all financial statements. The submission of inaccurate financial statements puts the CEO and CFO at risk of significant criminal penalties.[30] Along with these criminal penalties, the top executive could also face other fiscal penalties arising from a SCA. The greater accountability has given managers stronger incentives to be mindful of misconduct, ensuring it does not occur.

The greater criminal penalties for top executives make them more vulnerable. As a consequence, the tacit power exercised by executives is likely to be reduced post-SOX. The loss of power is likely to be more substantial for lobbying firms. The potential consequences of whistleblowing may also have been reduced substantially, which creates incentives for economic agents to uncover and reveal corporate misconduct.

SOX also enhanced the role of auditors, making them a more important agent in the discovery of misconduct. As a result, auditors face an increased workload due to the new disclosure requirements associated with SOX, and this has resulted in an increase in audit fees from 74% to 86% (Raghunandan and Rama, 2006). Griffin and Lont (2007) show that there has been an increase in audit risk post-SOX that can be attributed to an increase in the liability auditors face if financial fraud is uncovered. Auditors now have a greater incentive to reveal fraudulent activity because of the increased exposure to liability. The collapse of Arthur Andersen, following the Enron scandal, also served as a cautionary example and created incentives for auditors to bring misconduct to light. Consistent with this expectation, Dyck et al. (2010) find that auditors are significantly more likely to detect fraud post-SOX. Post-SOX auditors detect misconduct for 23.7% of cases and pre-SOX they account for 6.1% of cases. The liability auditor's face will be more substantial for very large firms, such as lobbying firms.

SOX also provided protection for employee whistle-blowers. The provisions require the establishment of a confidential anonymous submission process for concerns about questionable accounting or auditing issues. The provisions also protect employees from being fired or other retaliatory actions by firms. These changes have also improved the

[30] If the company mistakenly submits inaccurate financial statements, then the CEO and CFO could be subject to a fine of up to $1 million and 10 years in prison. If the company purposely submits inaccurate financial statements, then the penalties could be a fine of up to $5 million and 20 years in prison.

incentives for employees to reveal corporate misconduct. The retaliation and harassment that employee whistle-blowers face are likely to be more substantial if the company is large and powerful, such as lobbying firms. As a result, employees who blow the whistle on lobbying firms are more likely to face a severe backlash. Dyck et al. (2010) find that many employee whistle-blowers have been forced to move because of the personal harassment they faced. The employee protections mandated by SOX help employee whistle-blowers feel safer and more willing to speak out against powerful lobbying companies.

Finally, the SEC likely plays a larger role as a detector of misconduct post-SOX. SOX provided additional funding to the SEC and required more frequent reviews of financial statements to be conducted. The SEC is expected to be more likely to go after lobbying firm's post-SOX because any political protection that may have existed prior to SOX has been diminished. Cox and Thomas (2006) observe that the SEC is targeting larger firms post-SOX. Since lobbying firms are typically larger in size, they are included in the group of firms that face greater scrutiny from the SEC.

Theory suggests that mandatory disclosures are useful in combatting fraudulent activities and improving confidence in the market (Easterbrook and Fischel, 1984; Mahoney, 1995). As such, the greater disclosure requirements imposed by SOX should be useful in combatting fraud. Furthermore, better disclosures also make it more difficult for a firm to influence a court or judge compared to when there are no specific disclosure requirements (Shleifer, 2005). As a result, better connected and more powerful firms may find it more difficult to influence the course of justice after the implementation of regulations requiring stricter disclosures, such as SOX.

Overall, it is likely that SOX has had an impact on the detection of misconduct. Executives of lobbying firms are likely to hold less tacit power as a result, which means that economic agents are more willing to speak up about corporate misconduct. SOX has also improved the incentives for auditors, employees and the SEC to bring managerial misconduct to light, particularly against lobbying firms. Consequently, lobbying firms should be less likely to get away with their misconduct for longer after the enactment of SOX. This expectation leads to Hypothesis 1b.

Hypothesis 1b: Lobbying firm's ability to conceal their misconduct declines after SOX.

There are two primary outcomes to a SCA: (1) dismissed in favour of the firm or (2) an out-of-court settlement. Very few cases ever go to trial. In a SCA, the onus is on the plaintiff to prove that any managerial wrongdoing has actually occurred. To receive a settlement payout, investors need to prove that managers have actually violated securities laws.

Pre-SOX economic agents will be less willing to blow the whistle on firms because of the risk of potential backlash due to the tacit power that lobbying firms wield. The fear of repercussions may also make it more difficult to collect evidence proving that managers have violated securities laws. This could mean that parties are less willing to assist investors in their lawsuit by not testifying or providing documentation of managerial wrongdoing. Consequently, investors may find it more difficult to win a class action against a firm that lobbies pre-SOX. This leads to Hypothesis 2a.

Hypothesis 2a: Lobbying firms are less likely to settle class actions before SOX.

As noted earlier, SOX has made top executives more vulnerable to severe penalties if they do commit corporate misconduct. The tacit power exercised by managers has been reduced since the implementation of SOX. In the same vein, the fear of repercussions has also lessened, making people more willing to help investors by providing evidence of managerial wrongdoing. The greater protection post-SOX for employee whistle-blowers suggests that employees are more willing to assist investors in their class actions. These changes mean that it would be easier for investors to gather evidence to prove that corporate misconduct has occurred and managers of lobbying firms will be more likely to settle a SCA during the post-SOX period, relative to the pre-SOX period. This expectation leads to Hypothesis 2b.

Hypothesis 2b: Lobbying firms are more likely to settle class actions after SOX.

It is important to note that not all SCAs are meritorious. Numerous class actions are frivolous in nature where the plaintiffs attempt to regain losses unrelated to illegal activities. Firms may settle frivolous or nuisance class actions to avoid potential negative publicity or the costs of litigation. Since directors' and officers' (D&O) insurance generally covers these settlements, settling can be an attractive way of getting rid of a frivolous case. Therefore, settled cases can either be meritorious or frivolous in nature.

Hypothesis 1a predicts that pre-SOX managers of lobbying firms are able to evade detection for longer. The longer detection time gives delinquent managers more opportunities to commit misconduct, destroying investors' wealth. Pre-SOX lobbying firms have more time for impropriety, accrue greater losses to the firm and therefore should face harsher penalties.

Prior research has found that the size of the settlement is related to the provable loss and the length of the period the misconduct occurred, both of which can be seen as a measure of the extent or complexity of the violation (Karpoff et al., 2007; Cox and Thomas, 2006). This result indicates that the greater the damage due to manager misconduct, the more severe the penalties are in terms of the settlement size. Lobbying firms are expected to accrue greater losses as a result of being able to evade detection for longer. Therefore, they should end up having to pay larger settlements when they are sued. This leads to Hypothesis 3a.

Hypothesis 3a: Lobbying firms cause more damage and face a larger settlement before SOX.

Post-SOX, it is expected that lobbying firms will not be able to evade detection for longer, nor will they have the same opportunities to destroy investor wealth as they did in the pre-SOX period. Based on these expectations, the losses accrued and the settlement amount should be similar in size for lobbying and non-lobbying firms post-SOX. This expectation leads to Hypothesis 3b.

Hypothesis 3b: Lobbying firms cause less damage and face smaller settlements after SOX.

On the whole, evidence consistent with Hypothesis 1a would confirm Yu and Yu (2011) and evidence consistent with Hypothesis 1b would confirm evidence provided by Dyck et al. (2010) that auditors are more aggressive post-SOX and whistle-blowers are more motivated by rewards and less intimidated by executives post-SOX. Findings in support of Hypotheses 2a and 3a would also confirm Yu and Yu (2011) and the main contribution comes from Hypotheses 2b and 3b. In particular, after SOX, this chapter examines whether lobbying firms are more likely to settle class action suits filed against them and whether both the detected damages and settlement awards are likely to be smaller.

3.3 Method

3.3.1 Length of the Class Period

Hypotheses 1a and 1b predict lobbying firms will be able to evade detection for longer in the pre-SOX period but not in the post-SOX period. A firm's ability to evade detection is measured by the length of the class period. The class period is defined as the length of time the alleged misconduct occurred over, which is specified by the investors in the SCA. While this is an imperfect measure, it gives a good indication of the length of time managers were able to avoid detection.[31]

Equation (3.1) is estimated to determine if the class period is longer for firms that lobby.

$$DaysinCP = \beta_0 + \beta_1 Lobby + \Sigma\beta \cdot Controls + \varepsilon \quad (3.1)$$

The dependent variable in this model is the natural log of the number of days in the class period.[32]

In this analysis, *Lobby* represents one of two measures for the extent of lobbying a firm conducts. The first measure is a dichotomous variable taking a value of one if the firm has undertaken lobbying at any point in time during the two years prior to the filing year and zero otherwise. The second lobbying measure is the log of the total dollar value of lobbying expenses undertaken in the two years prior to the filing year.[33] These two measures of lobbying will be used throughout the analysis. There are two reasons for using this two-year period. First, two years should be an adequate amount of time for a political relationship to have been developed. Second, the length from the beginning of the class period, when the accusation of malfeasance is made, to the filing date can be quite significant. The average length of the class period is 424 days and the filing delay has an average length of 141 days in the sample.[34] Since the primary focus is on whether

[31] The length of the class period is defined by investors, so it may not precisely measure the actual time period of the misconduct, if any misconduct even occurred.
[32] For a full list of variables used in this study and how they were calculated, see Table 3.1.
[33] Rerunning the analysis using the total dollar value of lobbying expenses scaled by the total value of assets provides quantitatively similar results.
[34] The filing delay is the period between the end of the class period and the filing of the class action.

lobbying facilitates misconduct, two years should be an adequate amount of time to effectively capture this effect.[35]

Hypotheses 1a and 1b examine the impact lobbying has on the duration of the class period, based on whether the class action relates to the pre-SOX or post-SOX eras. To test these hypotheses, the sample is divided into two based on the implementation of SOX. The pre-SOX period is defined as any class action that was filed in or earlier than 2004 and the post-SOX period includes any class actions filed in 2005 or later. The reason for using 2004 rather than July 2002, when SOX was signed, relates to the distinction and time elapsed between the commencement of the class period and the filing of the class action. The average number of days between the beginning of the class period and the filing is 565 days. It is expected that the majority of firms that are being sued in 2004 will have begun committing the alleged misconduct prior to the implementation of SOX, as such manager's actions are likely to be reflected in the pre-SOX era.

The definition of the pre-SOX period extending up to the end of 2004 is also consistent with the Yu and Yu (2011) sample period. Throughout the rest of the analysis, the same 2004 definition of the pre-SOX and post-SOX periods will be used. The empirical analysis was also conducted using 2002 or 2003 as the cut-off for the pre-SOX period, and it yields analytically equivalent results.

Hypothesis 1a states that the class period will be longer for firms that lobby in the period before SOX. If this hypothesis is accepted, the Lobby coefficient in equation (3.1) will be positive and statistically significant. On the other hand, Hypothesis 1b states that post-SOX firms that lobby will not be able to evade detection for longer. If this hypothesis is accepted, the Lobby coefficient in equation (3.1) will be insignificant.

A series of control variables are also included in this model. Three variables, *Settled, ProvableLoss* and *DaystoFile*, are used to control for the extent or the complexity of the misconduct. *Settled* is a dichotomous variable taking the value of one if the class action is settled in favour of the firm and zero otherwise. *ProvableLoss* is the percentage change in the firms' market capitalisation from the beginning of the class period to the end of the class period. *DaystoFile* represents the number of days between the end of the class period and the filing day.

[35] Yu and Yu (2011) define a firm as a lobbying firm if they have lobbied at any point during their sample period, irrespective of when the firm was sued. Using information on firm lobbying activities in the two years before the filing of a class action will better reflect the influence that they held during the period of alleged misconduct.

The model also incorporates four firm characteristics. *Size* is the firm size measured as the natural log of the firm's market capitalisation. *Leverage* is the ratio of total debt to assets. *ROA* is the firm's net income divided by the beginning-of-year total assets. *B/M* is the ratio of book value of the equity-to-market value of equity. All firm financial characteristics used in the regressions throughout the analysis are calculated for the year ending prior to the year the class action was filed. Forty-eight industry dummy variables, as specified by Fama and French (1997), are included to control for industry effects. Yearly dummy variables are also included to control for time and market-related effects.

3.3.2 Probability of Settlement

Hypotheses 2a and 2b state that firms that lobby will be less likely to settle a class action filed against them in the pre-SOX period and will be equally likely to settle after the enactment of SOX.

A logit regression is used to test this hypothesis. The model stated in equation (3.2) is estimated for all firms that are being sued. The dependent variable, Settled, takes the value of one if the case is settled and is zero otherwise.

$$Settled = \beta_0 + \beta_1 Lobby + \Sigma\beta \cdot Controls + \varepsilon \quad (3.2)$$

Once again, the primary variable of interest is *Lobby*. Hypothesis 2a states that firms that lobby in the pre-SOX period will be less likely to settle a class action filed against them. If this hypothesis is accepted, the *Lobby* coefficient in equation (3.2) will be negative and statistically significant.

Hypothesis 2b, on the other hand, states that post-SOX lobbying will make no difference to the likelihood of a firm settling a class action. If this hypothesis is accepted, the *Lobby* coefficient in equation (3.2) will be insignificant.

The control variables in this model are very similar to those implemented by Karpoff et al. (2007) and Cheng et al. (2010) and are very similar to those defined in equation (3.1).

3.3.3 Settlement Size

Hypothesis 3a states that lobbying in the pre-SOX period will provide managers with greater opportunities to accrue more substantial losses and will face greater penalties as a

result. On the other hand, Hypothesis 3b states that in the post-SOX period there will be no difference in terms of the losses and the size of the settlement between lobbying and non-lobbying firms.

These hypotheses are tested using two different measures of the damages caused by the managerial misconduct: (1) the losses associated with the class actions and (2) the size of the settlement.[36] The first regression will be run on all firms with a class action filed against them as specified in equation (3.3) below.

$$ProvableLoss = \beta_0 + \beta_1 Lobby + \Sigma\beta \cdot Controls + \varepsilon \quad (3.3)$$

In this model, the dependent variable is the provable loss. *ProvableLoss* is measured as the percentage change in the firms' market capitalisation from the beginning of the class period to the end of the class period. This measure is similar to that used by Karpoff et al. (2008a).[37] The authors find that their measure of provable loss more closely tracks regulators' estimates of damages than alternative measures.

If Hypothesis 3a is accepted so that lobbying allows managers to cause more significant damage, then the coefficient for the *Lobby* variable should be negative and significant.

An OLS regression is estimated over all class actions that were settled using the size of the settlement as the dependent variable. The model is specified in equation (3.4) below.

$$Settlement = \beta_0 + \beta_1 Lobby + \Sigma\beta \cdot Controls + \varepsilon \quad (3.4)$$

Settlement in this model is the log of the cash settlement amount. Hypothesis 3a states that firms that lobby will pay larger settlements as a result of causing more damage. If this hypothesis is correct, then the *Lobby* coefficient will be positive and significant. The results from model (3.4) should be consistent with model (3.3).

Hypothesis 3b states that post-SOX firms will not be able to cause as much damage and will therefore not face larger settlements. If this hypothesis is accepted, the *Lobby* variable will be insignificant in models (3.3) and (3.4).

[36] Karpoff et al. (2007) show that these two measures are related and should provide consistent results.

[37] Karpoff et al. (2008b) define their provable loss measure as the percentage change in the firms' market capitalisation from its highest point during the violation period to the first day news of a possible violation is revealed. The violation period used in their analysis will not be the same as the class period that is used in this analysis. Similarly, the first day news of a possible violation is revealed will not be the same day as the end of the class period. Despite these differences, the provable loss used by Karpoff et al. (2008b) should be quantitatively similar to the one used in this study.

3.3.4 Data

3.3.4.1 Sample Selection

As in Chapter 2 (see Section 2.3.4.1) data for SCAs in the US is obtained from the Stanford Securities Class Action Clearinghouse (SCAC).[38] All class actions listed between 2000 and 2012 are used for this analysis. The Stanford SCAC provides information on the filing date of the suit, the class period, ticker symbol and SIC code for all class actions filed after the institution of the Private Securities Litigation Reform Act (PSLRA). The outcome of the case has also been collected by reading through the case reports provided by the Stanford SCAC, and a dataset of settlement amounts has been compiled.

Individual firm financial data up to the end of 2012 is obtained from the CRSP/Compustat merged database. All firms with available data listed on the NYSE, NASDAQ or AMEX are included in the primary sample. Firms incorporated outside of the US are excluded from the sample due to possible differences in reporting standards.

The Lobbying Disclosure Act of 1995 (LDA) requires any organisation whose lobbying expenses exceed $20,000 semi-annually to file with the Senate Office of Public Records (SOPR) and the clerk of the House of Representatives. The Centre for Responsive Politics (CRP) maintains a database of the quarterly reports filed at SOPR since 1998.[39] One of the drawbacks of this database is that there is no breakdown as to how much is spent on lobbying particular agencies, since firms are not required to disclose this information. To calculate the lobbying variables that are used in the study, two years of prior data are required. In particular, lobbying firms are firms that have undertaken lobbying activities at any point in time during the two years prior to the filing year. Since lobbying information is only publicly available from 1998, this means that after calculating the lobbying variables there is sufficient data available to conduct the analysis from the year 2000 onwards.

[38] http://securities.stanford.edu/
[39] CRP maintains this database at https://www.opensecrets.org/.

3.3.4.2 Sample Statistics

Table 3.2 shows a comparison of characteristics between firms that lobby and those that do not.[40] The most obvious difference is that lobbying firms are significantly larger in size based on total assets and market capitalisation. The significant size disparity is consistent with prior research that has examined the determinants of lobbying (see Jin-Hyuk, 2008; Hill et al., 2013; Mathur et al., 2013). Almost all of the significant differences in this table can be attributed to the difference in size.

Table 3.3 presents summary statistics of key variables for lobbying and non-lobbying sued firms of the full sample period (2000 to 2012). Once again, lobbying firms are significantly larger in size. The average size for the sued firms is also larger for both lobbying and non-lobbying firms when compared to the full sample. The difference in size is consistent with the deep pockets theory, which posits that sued firms are typically larger in size because they are more attractive targets to extract settlements.

Class actions filed against lobbying firms are also significantly less likely to be settled. This result can also be attributed to the deep pockets theory and indicates that lobbying firms are more likely to have frivolous cases filed against them. This shows that it is important to control for the merits of the case throughout the analysis. It is also interesting to note that there is no significant difference in the number of days in the class period for the full sample period.

Table 3.4 shows the sample composition of sued firms by year and industry. In Panel A, for non-lobbying firms, there are a proportionally large number of class actions filed in 2001. This can be credited to the bursting of the tech bubble. These tech firms were generally start-up companies without resources to expend on lobbying, which explains why this increase in filings is exclusively for non-lobbying firms. As for lobbying firms, the number of class actions filed varies between 15 in 2011 to 55 in 2002.

Panel B of Table 3.4 shows a relatively consistent distribution of filings across industries for lobbying and non-lobbying firms. The most obvious differences are the proportionally higher number of sued lobbying firms in the finance and transportation industries and the proportionally lower number of sued lobbying firms in the service industry. These slight differences can be attributed to the differing need for lobbying across various industries. The sample analysed throughout this chapter includes firms in

[40] All variables presented are winsorised at the 1st and 99th percentiles.

the financial and utilities industries. Dropping firms from these industries does not materially affect the reported findings (see Appendix F).

Table 3.5 presents Spearman correlation coefficients between the independent variables used in the analysis. In general, the correlations are relatively low and the variance inflation factors (VIFs) are also very small. A high level of correlation is also evident between the settled and settlement size variables. The high correlation between these variables means that they will not be used in the same regression together as independent variables to avoid the issue of multicollinearity.

Figure 3.1 presents the mean and median amount spent on lobbying each year for sued and non-sued firms. The average amount spent on lobbying has generally been increasing over the sample period. The average amount spent on lobbying each year by sued firms is more than non-sued firms, which is consistent with sued firms being generally larger firms. The distribution of lobbying is positively skewed. There has also been a positive trend in the total amount spent on lobbying (see Figure 3.2). Based on these two figures, the lobbying being undertaken does not appear to differ substantially between sued and non-sued firms. It should also be noted that the amount spent on lobbying by sued and non-sued firms is highly correlated (0.95).

3.4 Results

3.4.1 Length of Class Period

In the first part of the analysis, the relationship between lobbying and the length of the class period during the pre- and post-SOX periods are examined. Hypothesis 1a states that lobbying firms will be able to get away with their misconduct for longer during the pre-SOX period. Post-SOX, however, it is conjectured that lobbying will have no impact on the time it takes to detect misconduct (Hypothesis 1b).

The hypotheses are tested using a univariate analysis across the pre- and post-SOX subsamples. The results of these tests can be found in Table 3.6. Panel A presents statistics for the full sample period (2000–2012). Panels B and C report class action statistics for the pre-SOX (2000–2004) and post-SOX periods (2005–2012), respectively. Panel B shows that the average number of days in the class period for firms that lobby is 93 days longer than non-lobbying firms. This difference is highly significant and is

consistent with the results obtained by Yu and Yu (2011). Interestingly, when the analysis is restricted to the post-SOX period in Panel C, the length of the class period is not significantly different between lobbying and non-lobbying firms. These two results are consistent with Hypotheses 1a and 1b, suggesting that lobbying firms were able to get away with their misconduct for longer before SOX but not after its implementation.

To more formally test whether lobbying has any impact on the length of the class period, equation (3.1) was estimated to control for the complexity of misconduct, firm characteristics and industry and time fixed effects. The results of these regressions are reported in Table 3.7. Models (1) and (2) in Table 3.7 report the results for the pre-SOX period. The primary variables of interest in these models are *Lobby Dummy* and *Lobby Amount*, both of which have positive coefficients and are highly significant. Consistent with Hypothesis 1a and Yu and Yu (2011), these results confirm that the class period is significantly longer for lobbying firms in the pre-SOX period.[41,42]

Models (3) and (4) in Table 3.7 report the regressions estimated for the post-SOX period. In these two models, neither *Lobby Dummy* nor *Lobby Amount* is significant. The results are consistent with Hypothesis 1b and suggest that post-SOX lobbying firms are not able to get away with corporate misconduct for longer.[43]

The main finding here is that pre-SOX lobbying firms were able to evade detection for longer. This can be attributed to the lobbying firms' tacit power. In the pre-SOX period, economic agents that are most likely to detect fraud may be fearful of potential repercussions and as such not willing to reveal corporate misconduct. This unwillingness to bring evidence of illegal corporate activities to light is likely to be worse for lobbying firms, since the penalties for opposing them would be much more severe because they are more powerful. As a result, lobbying firms were able to get away with their misconduct for longer.

SOX's requirement that top executives certify financial statements is expected to have curbed management's behaviour and has made them more vulnerable to the threat of being found guilty of corporate misconduct. This increased vulnerability to top executives from the threat of exposure increases the willingness of economic agents to report fraud and

[41] A replication of Yu and Yu's (2011) results has been performed and can be found in Appendix B.
[42] To account for the differences in the severity of class actions, Yu and Yu (2011) also ran value-weighted regressions based on settlement size and found similar results to their equally weighted regressions, indicating the results are not being driven by the severity of the fraud.
[43] Rerunning these regressions using the full sample instead of subsamples provides quantitatively similar results.

other illegal activities. Moreover, SOX has also improved the incentives and the ability for employees, auditors and the SEC to bring corporate misconduct to light. As a result, managers of lobbying firms are no longer able to get away with their misconduct for longer in the post-SOX period.

SOX might not be the only factor driving the results. It is possible that investors may have also become more vigilant over time. Some very high-profile cases of misconduct came to light during the early 2000s, including Enron and WorldCom. These companies also spent millions of dollars each year on lobbying and made significant political contributions. The bankruptcies of these companies may have made investors more wary and cautious of potential political corruption associated with the large-scale political strategies these companies undertook. Investor cautiousness concerning lobbying expenditures may have prompted more monitoring to ensure that managers were not taking advantage of the political connections they had developed.

Lobbying may also have become less effective over time as a result of an increase in the number of entities lobbying and the amount of money being spent on lobbying. The Honest Leadership and Open Government Act of 2007 placed restrictions on lobbying activities, which would also limit the effectiveness of lobbying. In recent years, the US Congress has been at a near-constant gridlock and has been highly ineffective. As such, the benefits associated with lobbying for specific pieces of legislation could be more limited. If lobbying has become less effective at influencing political decisions over time, then it is also likely that lobbying firms will have seen a loss of their tacit power, which would support the results found so far.

SOX may not be the only reason for the change in the length of the class period for lobbying firms. The possible increase in investor vigilance and reduction in the benefits associated with lobbying may have adversely affected managers' ability to get away with their misconduct for longer. However, SOX is most likely to have had the largest effect on managers' ability to get away with corporate misconduct as a result of the loss of tacit power.

The evidence so far suggests that pre-SOX managers that lobbied were able to get away with their misconduct for longer. Post-SOX lobbying is no longer related to the length of the class period. These results indicate that changes surrounding the implementation of SOX have limited the opportunities for mangers to commit more severe misconduct.

3.4.2 Probability of Settlement

In this section, the relationship between lobbying and the probability of settlement is examined. Hypothesis 2a states that pre-SOX firms that lobby will be less likely to settle a class action.

To do this, a logit regression is estimated as in equation (3.2). The dependent variable in these regressions takes a value of one if the class action is settled and is equal to zero if it is dismissed. The results from these regressions are presented in Table 3.8. The regressions estimated for the pre-SOX period are presented in columns (1) and (2). The negative coefficients for the lobby variables indicate that firms that lobby in the pre-SOX period are less likely to have settled a case filed against them, which is consistent with Hypothesis 2a.

This result suggests that during the pre-SOX period it is more difficult to prove the occurrence of any illegal activities. The burden of proof in SCAs is on the plaintiff. As such, the investor class needs to prove that managers have violated securities laws. Collecting evidence to prove misconduct has occurred requires the cooperation of others, such as employees of the firm being sued. This cooperation is likely made more difficult if there is a fear of repercussion. It is expected that lobbying firms hold more tacit power and the fear of potential backlash is greater. As a result, people will be less likely to assist investors in their lawsuit, making the collection of evidence to prove managerial guilt more difficult if the firm lobbies. This result is only marginally significant, at the 10% level, so the impact of lobbying on whether the case was settled may be minimal.

Post-SOX, the tacit power that lobbying firms hold is expected to have been reduced and, as a result, the fear of repercussions is also expected to have fallen. Investors that are suing a lobbying firm should find it easier to collect evidence of misconduct because people will be more willing to cooperate. Based on this expectation, Hypothesis 2b predicts that after the implementation of SOX, lobbying will not have any impact on the probability of a class action being settled.

Models (3) and (4) in Table 3.8 present the regression results to examine whether lobbying has any influence on the probability of the class action being settled in the post-SOX period. Consistent with Hypothesis 2b, the results indicate that neither *Lobby*

Dummy nor *Lobby Amount* variables are significant. This result confirms that lobbying does not impact the outcome of class actions that were filed post-SOX.

These results suggest that SOX has had an impact on whether a class action is settled for lobbying firms. Pre-SOX lobbying firms were marginally less likely to settle a class action filed against them. However, post-SOX lobbying no longer appears to have an impact on the outcome of the case. The findings suggest that identifying the culpability of managers for lobbying firms that are subject to SCAs has improved following the enactment of SOX.

3.4.3 Settlement Size

In this section, the relationship between lobbying and the damages caused by the alleged misconduct is examined. Hypothesis 3a states that pre-SOX lobbying firms will cause more damage because they are able to get away with their misconduct for longer, thereby giving managers more opportunities to destroy investors' wealth. These outcomes also imply that lobbying firms will be more likely to face larger settlements.

Equation (3.3) is estimated to test this hypothesis. Provable loss is defined as the percentage change in the firm's market capitalisation from the beginning of the class period to the end of the class period. It is a measure of the dollar amount of damage managers have done to the value of the firm through their misdeeds. The regression results are presented in Table 3.9. If Hypothesis 3a is correct, the Lobby variables coefficients will be negative and statistically significant. The pre-SOX regressions, reported in models (1) and (2) show that the *Lobby Dummy* and *Lobby Amount* coefficients are both insignificant. There is no evidence that managers of lobbying firms cause more damage before the implementation of SOX.

There are a couple of possible explanations why lobbying may not have any impact on the amount of damage being done. First, any damage being done may be offset by performance enhancements that come from lobbying. Prior research has found firms that lobby typically perform better in the long run (Jin-Hyuk, 2008; Hill et al., 2013; Chen et al., 2015). The better performance may offset any extra damage due to managers' actions. Alternatively, firms that lobby may evade detection for longer but they may not take advantage of this opportunity.

To further examine whether lobbying is related to the severity of the misconduct, regressions were estimated with settlement size as the dependent variable, as given by equation (3.4). The results from these regressions are presented in Table 3.10. The pre-SOX regressions (models (1) and (2)) show that lobbying is not significantly related to the size of the settlement. This result is consistent with the findings for the provable loss and suggests managers of firms that lobby in the pre-SOX period do not cause more damage and, as a result, do not face greater penalties.

So far the results have shown that post-SOX firms that lobby are not able to evade detection for longer. As a result, it is expected that managers of lobbying firms would not be able to cause more damage after the implementation of SOX. This hypothesis is tested estimating the regressions during the post-SOX period to examine whether lobbying has any impact on the size of the provable loss or the settlement. The post-SOX regression models are reported in columns (3) and (4) of Table 3.9 and Table 3.10, respectively. The results show that lobbying is not significantly related to the provable loss or the settlement size after the implementation of SOX, which is consistent with Hypothesis 3b.

Overall, SOX appears to have limited the impact of lobbying on managers' ability to get away with corporate misconduct. Pre-SOX firms that lobbied were able to get away with corporate misconduct for longer and were marginally less likely to have to settle a SCA. Although managers of the lobbying firms were able to evade detection for longer, they do not appear to have done more damage during this time period.

Post-SOX lobbying is no longer related to either the length of the class period or the probability of a case being settled. This change can most likely be attributed to a loss in the tacit power that lobbying firms once held. Based on this evidence, SOX appears to have been beneficial in reducing the potentially harmful effects that political connections can have on the detection of corporate misconduct.

3.4.4 Robustness

The results documented so far in this chapter are consistent with SOX reducing the tacit power of lobbying firms. As already mentioned above, an alternative explanation is that investors became warier of large powerful firms after high-profile cases of misconduct, such as Enron and WorldCom, came to light. As a result of this distrust, investors may increase monitoring activities and be more watchful for evidence of misconduct. It is

likely that this effect, if it does indeed drive the results, is temporary, since investors tend to have a short memory.

To examine this, the post-SOX period is split into two subsamples. The first sub-period is from 2005 to 2008 and the second sub-period is from 2009 to 2012. If investor wariness is indeed driving the results, the lobbying activities should not be related to the number of days in the class period from 2005 to 2008. In the 2009 to 2012 period, when investor wariness declined, lobbying firms should once again be able to evade detection for longer. The results from these regressions can be found in Table 3.11. For both sub-periods, lobbying is not significantly related to the length of the class period. This indicates that more vigilant investors are unlikely to be the reason for the results found and the most likely explanation is SOX.

Notwithstanding the above, it remains a possibility that a third factor has caused the change in the relationship over time, and as such one should be cautious about interpreting the results beyond SOX being the 'most likely cause' of the change. The fundamental point in this chapter is that the relationship identified by Yu and Yu (2011) between lobbying and the length of fraud no longer holds after 2004.

3.5 Conclusion

This chapter examines the relationship between lobbying and SCAs. It is found that up to 2004, lobbying is positively related to the length of the class period and marginally negatively related to the probability of a class action being settled. The results are consistent with lobbying firms wielding a substantial amount of tacit power, making economic agents less willing to reveal misconduct for fear of the potential repercussions. The fear of repercussions also makes it more difficult for the investor class to collect evidence to prove that managers have violated securities laws because parties will be less willing to cooperate.

From 2005 onwards, lobbying is no longer related to the length of the class period and the probability of a settlement. The most likely reason for the change in this relationship is SOX. SOX introduced severe penalties for top executives if a firm is found to have committed fraudulent activities, reducing the amount of tacit power lobbying firms held. SOX also improved the incentives and the ability for employees, auditors and the SEC to reveal corporate misconduct. As a result, economic agents should be more willing to

identify corporate misconduct and assist investors in their class action against firms that lobby post-SOX.

This chapter also examines whether managers of lobbying firms have more opportunities to cause significant damage to investors. The size of the loss to investors and the cash settlement are not affected by whether the firm lobbies. It is possible that up to 2004 managers of lobbying firms may be able to get away with corporate misconduct for longer and cause more damage, but these extra losses are being offset by the enhanced performance that is associated with lobbying activities.

It should be noted that lobbying is just one form of political connection, aimed at influencing legislative decisions. Other common forms of political connections examined in the literature include Political Action Committee (PAC) donations, as well as relationships between managers and politicians. Accounting for these other forms of political relationships would provide a more complete view of how political connectedness or tacit power could impact the detection of misconduct. However, an examination of these other forms of political connection is beyond the scope of this chapter.

The results indicate that the longer class period for lobbying firms identified by Yu and Yu (2011) is only evident up to 2004. Lobbying firms are not able to get away with their misconduct for longer after 2005. The most likely reason for this change is the loss of tacit power stemming from the enactment of SOX. As such, SOX appears to have been beneficial in restricting the power of large politically influential companies.

Table 3.1: Variable Definitions

Panel (A): Lobbying Variables	
Variable	Definition
Lobby Dummy	Dummy variable equal to one if the firm has lobbied over the prior two years and zero otherwise. Source: CRP.
Lobby Amount	Natural log of the total dollar value of lobbying expenses undertaken over the prior two years. Source: CRP.
Panel (B): Measures of the Extent of and Complexity of the Violation	
Settled	Dummy variable equal to one if the class action was settled and zero otherwise. Source: Stanford SCAC.
Settlement	The log of the cash settlement. Source: Stanford SCAC
Provable Loss	The percentage change in the firm's market capitalisation from the beginning of the class period to the end of the class period. Source: CRSP.
Days in CP	The number of days in the class period. Source: Stanford SCAC.
Days to File	The number of days between the end of the class period and the filing date. Source: Stanford SCAC
Panel (C): Other Variables	
Size	Natural log of the firm's market capitalisation. Source: Compustat.
Leverage	Ratio of total book value of current and long term debt (#34 + #39) to assets (#6). Source: Compustat.
ROA	Ratio of net income (#172) to beginning of year assets (#6). Source: Compustat.
B/M	Ratio of book value of equity (#60) to market capitalisation. Source: Compustat.
Ind	48 industry dummy variables in accordance with Fama and French (1997). Source: Compustat.
Year	Dummy variables equal to one for a particular year and zero otherwise.

Table 3.2: Comparison Lobby and Non-Lobby

Table 3.2 reports descriptive statistics for lobbying and non-lobbying firm-year observations between 2000 and 2012. The table includes the mean and number of observations for the selected variables. The means are winsorised at the 1st and 99th percentiles to remove the effect of outliers. The difference between the two samples are calculated as the mean of the lobbying firms variable less the mean of the non-lobbying firms variable and these are shown in the last column with significance calculated using a paired t-test. Variables definitions can be found in Table 3.1. *, **, *** Statistically different from zero at the 10, 5 and 1 percent significance levels, respectively.

	Lobby		Non-Lobby		
	Mean	N	Mean	N	Difference (Lobby-Non-Lobby)
Firm Values					
Assets	20,550.62	11,262	1,290.26	48,766	19,260.36***
Market Cap	11,214.31	11,262	785.91	48,766	10,428.39***
Debt	5,514.52	11,213	294.96	48,562	5,219.56***
Leverage	0.25	11,213	0.19	48,562	0.06***
PPE/Assets	0.50	10,769	0.45	40,743	0.04***
EBIT	1,171.27	11,238	66.42	48,173	1,104.85***
ROA	-0.01	11,260	-0.07	48,718	0.07***
B/M	0.55	11,261	0.81	48,762	-0.26***
CAPEX/Assets	0.05	11,100	0.04	45,790	0.00***
Sales	8,549.99	11,260	687.59	48,718	7,862.41***
Cash/Assets	0.11	11,084	0.14	48,362	-0.03***
Dividends/Assets	0.01	11,219	0.01	48,644	0.00***
Governance					
Percent Outsiders	0.75	6,377	0.69	10,288	0.06***
Board Size	10.32	6,377	8.77	10,288	1.55***
CEO Dual	0.77	6,377	0.67	10,288	0.10***
Entrenchment Index	2.26	5,111	2.14	8,132	0.12***
Lobby Data					
Lobby Amount	895,140.88	11,262			

Table 3.3: Comparison Sued Lobby and Sued Non-Lobby

Table 3.3 reports descriptive statistics for sued lobbying and sued non-lobbying firm-year observations between 2000 and 2012. The table includes the mean and number of observations for the selected variables. The means are winsorised at the 1st and 99th percentiles to remove the effect of outliers. The difference between the two samples are calculated as the mean of the sued lobbying firms variable less the mean of the sued non-lobbying firms variable and these are shown in the last column with significance calculated using a paired t-test. Variables definitions can be found in Table 3.1. *, **, *** Statistically different from zero at the 10, 5 and 1 percent significance levels, respectively.

	Lobby		Non-Lobby		
	Mean	N	Mean	N	Difference (Lobby-Non-Lobby)
Firm Values					
Assets	57,621.31	362	4,235.23	825	53,386.08***
Market Cap	16,002.72	372	1,139.75	850	14,862.97***
Debt	20,640.59	370	2,492.79	848	18,147.80***
Leverage	0.27	360	0.19	823	0.08***
PPE/Assets	0.43	338	0.32	793	0.12***
EBIT	1,597.35	362	138.92	820	1,458.43***
ROA	-0.11	372	-0.38	849	0.28***
B/M	0.47	372	0.69	850	-0.22
CAPEX/Assets	0.05	356	0.05	810	0.00
Sales	13,006.19	362	1,101.50	824	11,904.68***
Cash/Assets	0.12	358	0.20	815	-0.09***
Dividends/Assets	0.01	360	0.00	820	0.01***
SCA Info					
Settled	0.48	372	0.65	850	-0.17***
Days in CP	453.60	372	411.23	849	42.37
Days to File	134.41	372	143.23	849	-8.82
Settlement (millions)	113.30	155	22.79	330	90.51*
Lobby Data (Prior 2 Years)					
Lobby Amount	2,154,966.49	372			

Table 3.4: Comparison Sued Lobby and Sued Non-Lobby Distribution

Table 3.4 reports the number of SCAs filed each year and in each industry for the sample of class actions filed during the period of 2000 to 2012 obtained from the Stanford Securities Class Action Clearinghouse. Panel A displays the number and percentage of SCAs filed each year for lobby and non-lobby firms. Panel B reports the frequency of class actions by industry for lobby and non-lobby firms.

Panel A: Distribution of Sample across Years

Year	Non-Lobby	Percentage	Lobby	Percentage
2000	73	8.6%	35	9.4%
2001	256	30.1%	35	9.4%
2002	58	6.8%	55	14.8%
2003	62	7.3%	27	7.3%
2004	77	9.1%	26	7.0%
2005	65	7.6%	27	7.3%
2006	37	4.4%	20	5.4%
2007	49	5.8%	23	6.2%
2008	47	5.5%	42	11.3%
2009	35	4.1%	24	6.5%
2010	36	4.2%	27	7.3%
2011	37	4.4%	15	4.0%
2012	18	2.1%	16	4.3%
Total	850	100.0%	372	100.0%

Panel B: Distribution of Class Actions across Industries

Industry	Non-Lobby	Percentage	Lobby	Percentage
Agriculture, Forestry and Fishing	0	0.0%	0	0.0%
Mining	11	1.3%	9	2.4%
Construction	9	1.1%	1	0.3%
Manufacturing	325	38.2%	138	37.1%
Transportation	50	5.9%	61	16.4%
Wholesale Trade	29	3.4%	4	1.1%
Retail Trade	49	5.8%	13	3.5%
Finance, Insurance and Real Estate	71	8.4%	63	16.9%
Services	299	35.2%	82	22.0%
Public Administration	0	0.0%	0	0.0%
Other	7	0.8%	1	0.3%
Total	850	100.0%	372	100.0%

Table 3.5: Correlations

Table 3.5 shows the matrix of Spearman correlation coefficients for the independent variables. Correlations are calculated based on the full sample of sued firms that are analysed. Variance inflation factors (VIFs) are also presented. Variable definitions can be found in Table 3.1.

	Lobby Dummy	Lobby Amount	Settlement	Settled	Provable Loss	Days in Class Period	Days to File	Size	Leverage	ROA	B/M	VIF
Lobby Dummy	1.00											1.38
Lobby Amount	0.99	1.00										
Settlement	-0.06	-0.06	1.00									
Settled	-0.15	-0.15	0.99	1.00								1.06
Provable Loss	0.02	0.01	-0.10	-0.13	1.00							1.04
Days in Class Period	0.04	0.04	0.11	0.12	-0.03	1.00						1.03
Days to File	-0.05	-0.04	-0.13	0.01	-0.06	0.08	1.00					1.06
Size	0.50	0.55	-0.04	-0.17	0.03	-0.03	-0.18	1.00				1.59
Leverage	0.16	0.17	0.07	-0.03	-0.01	0.02	-0.06	0.11	1.00			1.04
ROA	0.11	0.12	-0.01	-0.09	0.11	0.00	-0.11	0.27	0.00	1.00		1.10
B/M	-0.06	-0.06	-0.03	0.05	-0.09	0.11	0.13	-0.27	-0.06	-0.09	1.00	1.12

Table 3.6: Comparison Sued Lobby and Sued Non-Lobby Over the Different Analysis Periods

Table 3.6 reports descriptive statistics for sued lobbying and sued non-lobbying firms. Panel A presents the mean and the number of observations for the selected variables for the full period, which ranges from 2000 to 2012. Panel B presents the mean and the number of observations for the selected variables for the pre-SOX period, from 2000 to 2004. Panel B presents the mean and the number of observations for the selected variables for the post-SOX period, from 2005 to 2012. The means are winsorised at the 1st and 99th percentiles to remove the effect of outliers. The difference between the two samples are calculated as the mean of the sued lobbying firms variable less the mean of the sued non-lobbying firms variable and these statistics are shown in the last column with significance calculated using a paired t-test. Variables definitions can be found in Table 3.1. *, **, *** Statistically different from zero at the 10, 5 and 1 percent significance levels, respectively.

Panel A: Class Action Statistics for the Full Period (2000 to 2012)

	Lobby		Non-Lobby		Difference (Lobby-Non-Lobby)
Days in CP	453.60	372	411.23	850	42.37
Settled	0.48	372	0.65	850	-0.17***
Days to File	134.41	372	143.23	850	-8.82
Settlement (millions)	113.30	155	22.79	330	90.51*
Lobby Amount (Prior 2 Years)	2,154,966.49	372			

Panel B: Class Action Statistics for the Pre-SOX Period (2000 to 2004)

	Lobby		Non-Lobby		Difference (Lobby-Non-Lobby)
Days in CP	480.58	178	387.53	526	93.05***
Settled	0.60	178	0.75	526	-0.16***
Days to File	128.48	178	167.48	526	-38.99**
Settlement (millions)	159.39	85	29.36	184	130.03
Lobby Amount (Prior 2 Years)	1,930,544.43	178			

Panel C: Class Action Statistics for the Post-SOX Period (2005 to 2012)

	Lobby		Non-Lobby		Difference (Lobby-Non-Lobby)
Days in CP	428.86	194	449.64	324	-20.78
Settled	0.38	194	0.49	324	-0.11**
Days to File	139.85	194	103.94	324	35.92*
Settlement (millions)	57.34	70	14.51	146	42.83**
Lobby Amount (Prior 2 Years)	2,360,879.52	194			

Table 3.7: Regressions with Days in Class Period as the Dependent Variable

Table 3.7 reports OLS regression estimates for the effect the lobbying has on the number of days in the class period, using equation (3.1). The dependent variable in these regressions is the natural log of the number of days in the class period. The first two columns present the regressions estimated for the pre-SOX period, from 2000 to 2004. The last two columns present the regressions estimated for the post-SOX period, from 2005 to 2012. Standard errors are reported in parentheses. Variables definitions can be found in Table 3.1. *, **, *** Statistically different from zero at the 10, 5 and 1 percent significance levels, respectively.

	Dependent Variable: Log of Days in Class Period			
	Pre-SOX: 2000 to 2004		Post-SOX: 2005 to 2012	
	(1)	(2)	(3)	(4)
Lobby Dummy	0.24***		-0.10	
	(0.09)		(0.11)	
Lobby Amount		0.02**		-0.01
		(0.01)		(0.01)
Settled	0.15**	0.15**	0.19**	0.19**
	(0.07)	(0.07)	(0.09)	(0.09)
Provable Loss	-0.09	-0.09	0.04	0.04
	(0.06)	(0.06)	(0.04)	(0.04)
Days to File	0.00	0.00	0.04	0.04
	(0.02)	(0.02)	(0.03)	(0.03)
Size	-0.02	-0.02	0.01	0.01
	(0.02)	(0.02)	(0.03)	(0.03)
Leverage	0.33**	0.34**	0.00	-0.01
	(0.15)	(0.15)	(0.20)	(0.20)
ROA	-0.01	-0.01	0.08	0.08
	(0.08)	(0.08)	(0.22)	(0.22)
B/M	0.10***	0.10***	0.04	0.04
	(0.03)	(0.03)	(0.04)	(0.04)
Intercept	5.48***	5.51***	5.40***	5.40***
	(0.19)	(0.19)	(0.25)	(0.25)
R^2	0.05	0.05	0.02	0.02
N	677	677	458	458

Table 3.8: Regressions with Settled Dummy as the Dependent Variable

Table 3.8 reports logit regression estimates for the effect the lobbying has on the whether the class action was settled, using equation (3.2). The dependent variable in these regressions takes the value of one if the class action is settled and is equal to zero if it is dismissed. The first two columns present the regressions estimated for the pre-SOX period, from 2000 to 2004. The last two columns present the regressions estimated for the post-SOX period, from 2005 to 2012. Standard errors are reported in parentheses. Variables definitions can be found in Table 3.1. *, **, *** Statistically different from zero at the 10, 5 and 1 percent significance levels, respectively.

	Dependent Variable: Settled Dummy Variable			
	Pre-SOX: 2000 to 2004		Post-SOX: 2005 to 2012	
	(1)	(2)	(3)	(4)
Lobby Dummy	-0.42*		-0.11	
	(0.23)		(0.23)	
Lobby Amount		-0.03*		0.00
		(0.02)		(0.02)
Provable Loss	-0.63***	-0.63***	-0.11	-0.11
	(0.17)	(0.17)	(0.09)	(0.09)
Days in CP	0.20**	0.20**	0.21**	0.21**
	(0.10)	(0.10)	(0.10)	(0.10)
Days to File	0.05	0.05	-0.13**	-0.13**
	(0.05)	(0.05)	(0.06)	(0.06)
Size	-0.09	-0.08	-0.19***	-0.20***
	(0.06)	(0.06)	(0.07)	(0.07)
Leverage	-0.26	-0.25	0.34	0.33
	(0.41)	(0.41)	(0.42)	(0.42)
ROA	-0.07	-0.07	0.70	0.71
	(0.24)	(0.24)	(0.48)	(0.48)
B/M	0.04	0.04	-0.16	-0.16
	(0.11)	(0.11)	(0.11)	(0.11)
Intercept	0.10	0.03	0.54	0.57
	(0.73)	(0.74)	(0.74)	(0.75)
Pseudo R^2	0.07	0.07	0.05	0.05
N	677	677	458	458

Table 3.9: Regressions with Provable Loss as the Dependent Variable

Table 3.9 reports OLS regression estimates for the effect the lobbying has on the size of the provable loss, using equation (3.3). The dependent variable in these regressions is the percentage change in the firm's market capitalization from the beginning of the class period to the end of the class period. The first two columns present the regressions estimated for the pre-SOX period, from 2000 to 2004. The last two columns present the regressions estimated for the post-SOX period, from 2005 to 2012. Standard errors are reported in parentheses. Variables definitions can be found in Table 3.1. *, **, *** Statistically different from zero at the 10, 5 and 1 percent significance levels, respectively.

	Dependent Variable: Provable Loss			
	Pre-SOX: 2000 to 2004		Post-SOX: 2005 to 2012	
	(1)	(2)	(3)	(4)
Lobby Dummy	0.01		-0.08	
	(0.05)		(0.13)	
Lobby Amount		0.00		-0.01
		(0.00)		(0.01)
Settled	-0.18***	-0.18***	-0.14	-0.14
	(0.04)	(0.04)	(0.11)	(0.11)
Days in CP	-0.03	-0.03	0.06	0.06
	(0.02)	(0.02)	(0.06)	(0.06)
Days to File	-0.02	-0.02	-0.02	-0.02
	(0.01)	(0.01)	(0.03)	(0.03)
Size	0.01	0.01	-0.05	-0.05
	(0.01)	(0.01)	(0.04)	(0.04)
Leverage	0.02	0.02	-0.16	-0.16
	(0.09)	(0.09)	(0.24)	(0.24)
ROA	0.18***	0.18***	0.10	0.10
	(0.05)	(0.05)	(0.27)	(0.27)
B/M	-0.08***	-0.07***	-0.01	-0.01
	(0.02)	(0.02)	(0.05)	(0.05)
Intercept	-0.02	-0.03	0.10	0.08
	(0.17)	(0.17)	(0.43)	(0.44)
R^2	0.11	0.11	0.02	0.02
N	677	677	458	458

Table 3.10: Regressions with Settlement Size as the Dependent Variable

Table 3.10 reports OLS regression estimates for the effect the lobbying has on the size of the settlement, using equation (3.4). The dependent variable in these is the natural log of the cash settlement. Only those class actions that were settled with available data on cash settlement are used in these regressions. The first two columns present the regressions estimated for the pre-SOX period, from 2000 to 2004. The last two columns present the regressions estimated for the post-SOX period, from 2005 to 2012. Standard errors are reported in parentheses. Variables definitions can be found in Table 3.1. *, **, *** Statistically different from zero at the 10, 5 and 1 percent significance levels, respectively.

	Dependent Variable: Log of Cash Settlement			
	Pre-SOX: 2000 to 2004		Post-SOX: 2005 to 2012	
	(1)	(2)	(3)	(4)
Lobby Dummy	0.18		0.06	
	(0.20)		(0.15)	
Lobby Amount		0.02		0.01
		(0.02)		(0.01)
Provable Loss	-0.36**	-0.37**	-0.01	-0.01
	(0.16)	(0.16)	(0.05)	(0.05)
Days in CP	0.12	0.12	0.28***	0.28***
	(0.08)	(0.08)	(0.07)	(0.07)
Days to File	-0.07	-0.07	-0.03	-0.03
	(0.05)	(0.05)	(0.04)	(0.04)
Size	0.46***	0.44***	0.49***	0.49***
	(0.05)	(0.05)	(0.05)	(0.05)
Leverage	0.36	0.33	0.39	0.39
	(0.37)	(0.37)	(0.29)	(0.29)
ROA	-0.73***	-0.73***	-0.78**	-0.77**
	(0.26)	(0.26)	(0.35)	(0.35)
B/M	0.27**	0.26**	0.03	0.03
	(0.12)	(0.12)	(0.06)	(0.06)
Intercept	11.98***	12.09***	11.13***	11.15***
	(0.61)	(0.62)	(0.56)	(0.57)
R^2	0.41	0.41	0.48	0.48
N	259	259	205	205

Table 3.11: Regressions with Days in Class Period as the Dependent Variable

Table 3.11 reports OLS regression estimates for the effect the lobbying has on the number of days in the class period, using equation (3.1). The dependent variable in these regressions is the natural log of the number of days in the class period. The first two columns present the regressions estimated for the period from 2005 to 2008. The last two columns present the regressions estimated for the period from 2009 to 2012. Standard errors are reported in parentheses. Variables definitions can be found in Table 3.1. *, **, *** Statistically different from zero at the 10, 5 and 1 percent significance levels, respectively.

	Dependent Variable: Log of Days in Class Period			
	Post-SOX: 2005 to 2008		Post-SOX: 2009 to 2012	
	(1)	(2)	(3)	(4)
Lobby Dummy	-0.04		-0.12	
	(0.14)		(0.17)	
Lobby Amount		0.00		0.00
		(0.01)		(0.01)
Settled	0.19	0.20	0.14	0.14
	(0.12)	(0.12)	(0.15)	(0.15)
Provable Loss	0.05	0.06	-0.04	-0.04
	(0.05)	(0.05)	(0.09)	(0.09)
Days to File	0.07*	0.07*	0.02	0.02
	(0.04)	(0.04)	(0.04)	(0.04)
Size	0.03	0.02	-0.06	-0.07
	(0.04)	(0.04)	(0.05)	(0.06)
Leverage	0.02	0.02	-0.13	-0.14
	(0.27)	(0.27)	(0.30)	(0.30)
ROA	-0.09	-0.09	0.33	0.33
	(0.34)	(0.34)	(0.29)	(0.29)
B/M	0.05	0.05	-0.03	-0.03
	(0.05)	(0.05)	(0.12)	(0.12)
Intercept	5.21***	5.21***	5.97***	6.01***
	(0.32)	(0.33)	(0.40)	(0.41)
R^2	0.03	0.03	0.04	0.03
N	300	300	158	158

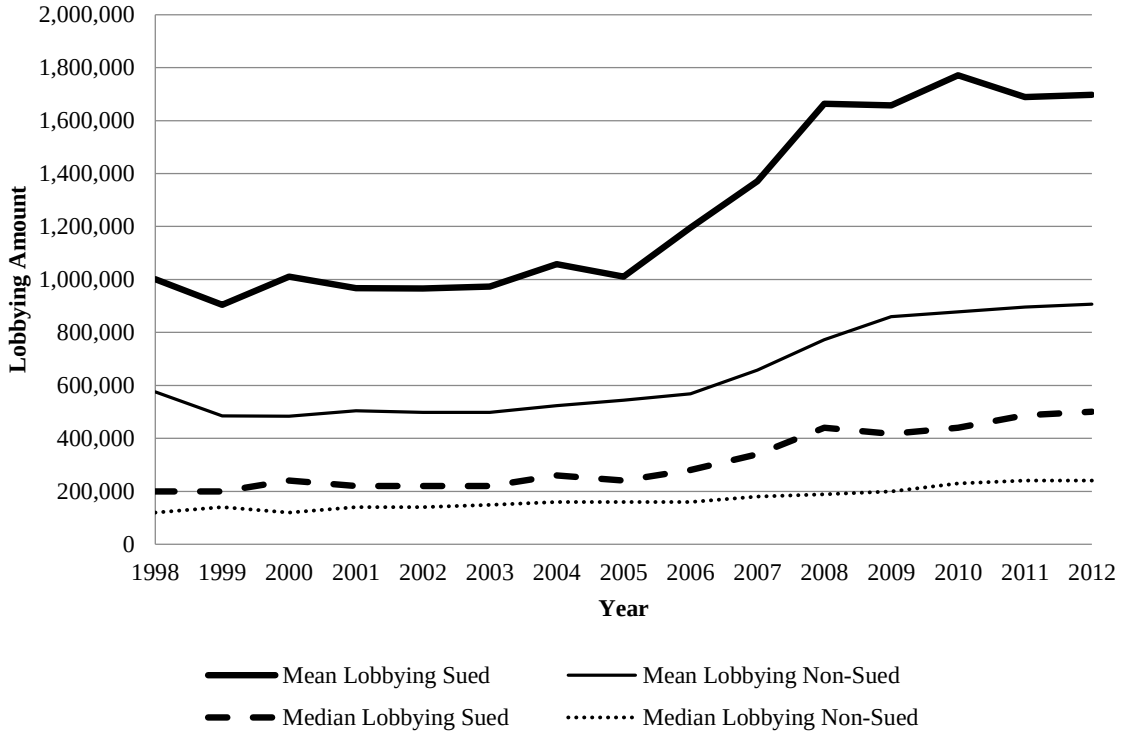

Figure 3.1: Mean and Median Amount Spent on Lobbying by Year
Figure 3.1 presents the mean and median amount spent each year on lobbying for sued and non-sued firms.

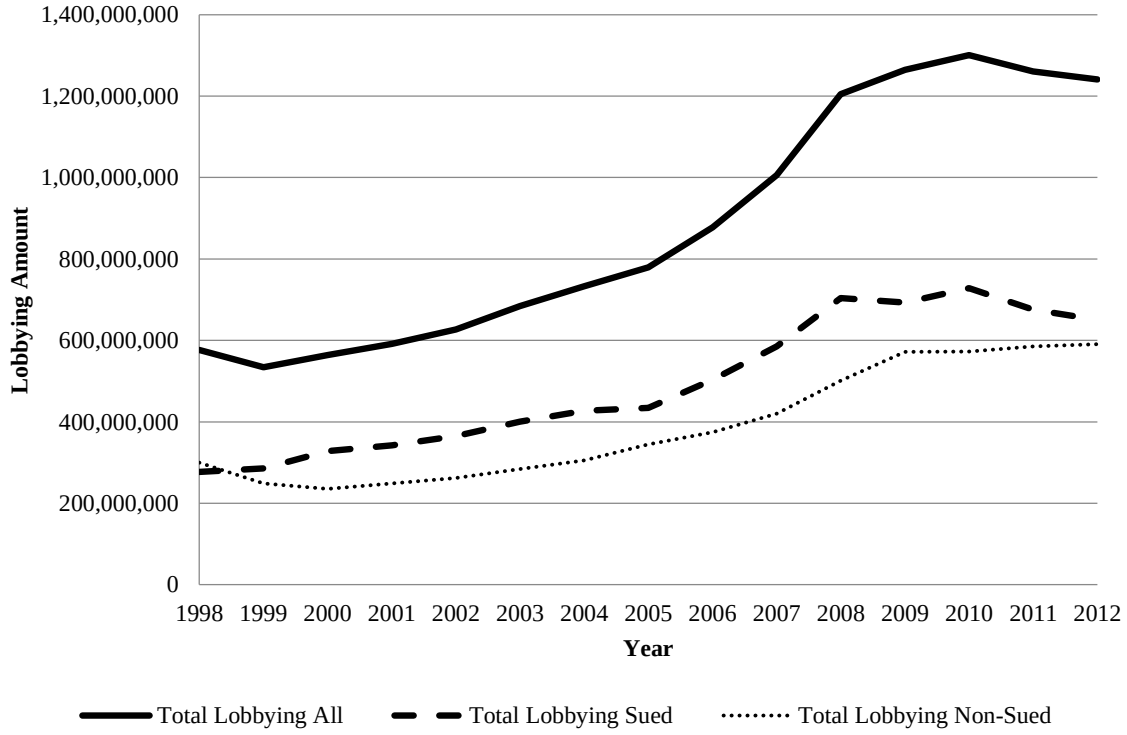

Figure 3.2: Total Amount Spent on Lobbying by Year

Figure 3.2 presents the total amount spent on lobbying each year for all firms and for sued and non-sued firms.

Chapter 4

Securities Class Actions and Innovation

4.1 Introduction

Innovation is essential for firms to remain competitive in international markets (Porter, 1992). To effectively motivate corporate innovation requires stakeholders to have a significant tolerance for failure (Manso, 2011). Consistent with this, firms are more innovative when managers have greater freedom and face fewer consequences for taking risks. However, fostering innovation by providing managers with greater freedom could also result in inadequate external oversight. This deficiency in oversight may provide managers with the opportunity to commit corporate misconduct. Despite this paradox, no research has examined whether managers take advantage of these opportunities. This chapter fills this gap in the literature by examining the relationship between securities class actions (SCAs) and a firm's innovative activities. This chapter also investigates how corporate innovation is impacted by the filing of a class action.

Under the fraud triangle framework, three conditions are evident when fraud occurs. These conditions are: rationalisations, opportunities and pressures (Cressey, 1953). Corporate innovation could impact one of these conditions by providing managers with more opportunities to violate securities laws. As discussed, greater managerial freedom can facilitate corporate innovation but could also inadvertently provide managers with greater opportunities to commit corporate misconduct. Furthermore, in order to maintain a competitive advantage, firms are naturally very secretive about their innovative activities.

The relative scarcity of disclosures surrounding innovative projects leads to a lack of transparency, which may provide further opportunities for managers to commit malfeasance.

Innovation could also influence the pressures to commit misconduct, another tenet of the fraud triangle framework. Innovation is a long and risky process with a high probability of failure (Holmstrom, 1989). To maintain a competitive advantage, firms have to continue to innovate successfully relative to their peers. A pressure to commit corporate misconduct may, therefore, arise when firms are unable to innovate successfully.

It is expected that a firm's innovative activities will not only impact the likelihood of misconduct occurring but also be affected by the filing of a SCA. Prior research has examined the impact that the litigation of patents (Lerner, 2010) and certain laws have on the innovative process (Acharya et al., 2014; Smeets, 2014). However, the existing literature has not investigated the effect of securities litigation on firm innovation. Firms face reputational penalties following shareholder litigation. These penalties may come in the form of higher cost of capital (see Chapter 2; Chava et al., 2010; Deng et al., 2014; Yuan and Zhang, 2015), which could adversely impact a firm's ability to fund innovative projects. As a result, it is expected that firms will invest more efficiently in innovation after the filing of a SCA.

This chapter makes several contributions to the growing body of research on the causes and consequences of SCA. This is the first empirical work that explicitly examines whether corporate innovative activities are associated with the probability of misconduct. The relationship is investigated in two ways. First, this chapter examines whether firms that are involved in some form of innovation are more likely to be sued. Second, among innovating firms, whether a firm's innovative success impacts the likelihood of shareholder litigation is analysed. As such, this chapter enhances the current understanding of the occurrence of corporate misconduct. The findings are, therefore, useful in improving market participant's ability to detect and potentially prevent the incidence of misconduct. This chapter also contributes to the extensive body of research on the impact of SCAs. Specifically, this chapter examines the impact the filing of a class action has on innovative inputs (R&D), outputs (Patents), the quality of outputs (Patent

Citations), the economic value of patents and firm innovative efficiency.[44] The results of this analysis further the understanding of the effectiveness of SCAs as an *ex-post* disciplinary mechanism.

To summarise, this chapter addresses the following research questions:

1) Are firms that innovate more likely to be subject to a SCA than firms that do not innovate?
2) Amongst firms that innovate, are firms that are relatively less innovatively successful more likely to be sued?
3) Does innovative efficiency improve after the filing of a SCA?

The key findings from the analysis are as follows. With respect to the first research question and consistent with expectations, firms are found to be more likely to be sued if they are innovating. The increased likelihood of being sued is primarily driven by whether firms are actively investing in innovation and not on whether firms have had some form of innovative success. This finding is consistent with innovative firms having greater opportunities to commit misconduct.

The analysis addressing the second research question, conducted among innovating firms only, shows that the level of innovative success is inversely related to the probability of a SCA. Furthermore, the change and relative change in value added by a firm's patents are also negatively associated with the probability of litigation. These results indicate that firms that are relatively unsuccessful innovators are more likely to be sued, which is consistent with these firms facing greater pressures.

The third research question explores the post-filing effects of SCAs on innovation. It is found that after the filing of a SCA, investment in innovation declines in the short-term. This appears to result in a drop in the quantity of the patents being produced. However, the quality of patents being produced, as measured by patent citations and the economic value added, appears to be relatively unaffected. Despite the impact on innovative inputs and outputs, the overall innovative efficiency is unaffected by the filing of a class action.

[44] Innovative efficiency is measured as the number of patents or citations scaled by R&D capital or expenditures (see section 4.3.1.3 for details). A full discussion of all of the innovation measures used and how they were calculated can be found in section 4.3.1.

The remainder of this chapter is organised as follows. Section 4.2 develops the hypotheses that are tested. Section 4.3 describes the methodologies and data used. Section 4.4 presents the empirical results and a discussion. Section 4.5 concludes.

4.2 Hypothesis Development

The fraud triangle is a framework that can be used to explain the occurrence of fraud. The fraud triangle is comprised of three factors: rationalisations, opportunities and pressures (Cressey, 1953). Consistent with this framework, prior research indicates that firms subject to a SCA are more likely to have inadequate oversight (McTier and Wald, 2011). This lack of oversight may provide managers with the opportunity to commit corporate misconduct.

Innovating firms may have more opportunities to commit fraud as a result of the secretive nature of the innovative process. Disclosures by innovative firms are likely to be less informative as any disclosed information may reveal the likelihood and timing of any innovations (Bhattacharya and Ritter, 1983), which may negatively impact a firm's competitive advantage. As such, innovative firms have an incentive to not disclose any non-essential information, which adversely impacts firm transparency. Unsurprisingly, R&D intensive firms exhibit higher information asymmetry (Aboody and Lev, 2000). As a result, it is more difficult for stakeholders to provide effective oversight, thereby providing managers with more opportunities to break the law.

To effectively motivate and nurture innovation, there needs to be a tolerance for failure (Manso, 2011). Consistent with this argument, Chemmanur et al. (2014) and Tian and Wang (2014) find that more failure tolerant venture capital backed firms are more innovatively successful.

Similar studies have found that innovation is more likely to occur with lower external pressures. For example, Fang et al. (2014) find that greater stock liquidity is associated with less innovation, which they argue could be caused by an increase in hostile takeover activity. Similarly, prior research has found that antitakeover laws established by states and more antitakeover defences at the firm level can lead to more innovation (Atanassov, 2013; Chemmanur and Tian, 2017).

Further, He and Tian (2013) examine the impact analysts have on innovation. Their findings show that firms produce fewer patents and receive fewer patent citations when

they are covered by a large number of analysts. They argue that this finding is consistent with analysts exerting too much pressure on managers to meet short-term goals. Similarly, Chy and Hope (2016) find that greater auditor conservatism negatively impacts innovative outputs. Overall, the literature indicates that firms are more innovative when managers have greater freedom and face fewer consequences from taking risks. However, fostering innovation by providing managers with this freedom may result in agency issues stemming from inadequate external oversight.

Innovative firms and sued firms also share a number of other characteristics. Innovation is more likely to occur under the guidance of an overconfident manager (Hirshleifer et al., 2012). Research also indicates that firms are more likely to face shareholder litigation with an overconfident CEO (Banerjee et al., 2017). Furthermore, innovative firms and sued firms use stock options incentives more extensively (Dusin et al., 2006; Lerner and Wulf, 2007; Peng and Roell 2008). These findings highlight the similarities in characteristics exhibited by both innovative firms and firms that face shareholder litigation.

As a result of the greater freedom and opacity, as well as the similarities between sued and innovative firms, it is expected that managers of innovative firms will have more opportunities to commit corporate misconduct. This expectation leads to the first hypothesis, which tackles the first research question of this chapter.

Hypothesis 1: Firms that innovate are more likely to be sued than firms that do not innovate due to having more *opportunities* to commit misconduct.

One of the other important factors of the fraud triangle is pressure. Finnerty et al. (2016) find that firms with a sustained period of good performance are more likely to commit fraud following a negative shock. This finding is consistent with performance related pressures leading to fraudulent behaviour. Firms that are innovating are doing so to remain competitive. As such, the more successful a firm is at innovating, the less pressure they will face to commit misconduct. Innovative firms will, however, face pressure to commit misconduct if they are not innovating successfully.

Innovation is a long and arduous process plagued with a significant amount of uncertainty and a high probability of failure (Holmstrom, 1989). An incentive for managers to commit corporate misconduct and conceal their failure arises when innovative projects do not come to fruition. The pressure on managers to achieve short-term earnings

targets will also motivate impropriety when they are unable to continue to innovate successfully. Therefore, it is expected that managers will be more likely to commit corporate misconduct when they are unable to achieve innovative success. This leads to the second hypothesis, which addresses the second research question

Hypothesis 2: Among firms that invest in innovation, firms that are struggling to innovate are more likely to commit misconduct due to the associated *pressures* to deliver on innovation investments.

Following the filing of a SCA, firms often face numerous reputational penalties. These penalties include an increase in the cost of debt (see Chapter 2; Deng et al., 2014; Yuan and Zhang, 2015) and an increase in the cost of equity (Chava et al., 2010). As a result of the increase in the cost of capital, firms will need to be more selective in the innovative projects that are pursued after the filing of a SCA.

Consistent with this, Autore et al. (2014) and Yuan and Zhang (2014) find that firms are less likely to seek external financing after being sued. They also find that R&D and capital expenditures decline significantly following the filing of a class action. Evidence also suggests that firms are more likely to be overinvesting before the filing of a class action (McTier and Wald, 2011). As such, the decline in investing observed by Autore et al. (2014) and Yuan and Zhang (2014) may be a result of managers cutting wasteful spending and focussing only on value additive projects.

Therefore, it is expected that while the total amount spent on innovation may decline after the filing, managers will invest in less risky projects that are relatively more likely to be successful. As such, it is expected that although the number of patents obtained may be unaffected or fall slightly, the firm's innovative efficiency will improve post-filing.[45] This leads to the third hypothesis, which in turn, addresses the third research question.

Hypothesis 3: Innovative efficiency will improve after the filing of a class action.

[45] See section 4.3.1.3 for details on how innovative efficiency is measured.

4.3 Method

4.3.1 Innovation Measures

The focus of this study is on whether a firm's innovative activity is associated with the probability of managerial misconduct and how that innovation is impacted following the filing of a class action. In this chapter, measures of innovative input, output and efficiency are used.

4.3.1.1 Innovative Input

The measure of innovative input used in this chapter is R&D expenditures scaled by firm assets. Although R&D has been used in the literature as a measure of innovation (e.g. Lerner and Wulf, 2007), there are several drawbacks to using it as a proxy for innovative inputs. First, R&D expenditures are often missing from financial statements. A blank R&D field could indicate a firm's decision to capitalise rather than expense or it could stem from the firm's decision to not separate R&D expenses from other expenses, such as expense shifting (McVay, 2006).

The other main drawback of using R&D expenditures as a measure of innovative input is that firms with zero or missing R&D may still receive patents. Koh and Reeb (2015) find that 10.5% firms with missing R&D receive patents. They also find that the missing R&D firms' patenting activity corresponds to the bottom 90^{th} percentile of positive R&D firms patenting activity. Although R&D is an imperfect measure, it is one of the few directly observable inputs in the innovation process. As such, it will provide a good indication of the amount a firm is investing in its innovative activities.

4.3.1.2 Patenting Activities

Firm patenting activities are used as a proxy for innovative outputs. Two main measures of a firms' patenting activity are used throughout the analysis. The first measure is the total number of granted patents. The patent application year is used as opposed to the grant year because the application year more accurately reflects the actual completion of the innovation (Griliches et al., 1986).

The second measure of patenting activity is the quality of patents being produced as measured by the average number of citations per patent. The number of patents gives an indication as to the extent of a firm's innovative activities, whereas the number of citations provides insight into the importance or the value of a firm's innovative activity. Prior research has found that citations are a good measure of the value of innovations (Hall et al., 2005; Kogan et al., 2017).

There are two types of truncation problems associated with patent data. The first truncation problem is caused by the lag between patent application and the eventual granting of the patent. Hall et al. (2001) find that this lag is about two years on average. Patent data up to the end of 2010 from Kogan et al. (2017) is used throughout the analysis. To mitigate the first truncation problem, the final two years of patent data are excluded from the sample. Therefore, patenting activities were analysed up to the end of 2008.

The second truncation problem is associated with the number of citations a patent receives. Patents receive citations over long periods of time (up to 50 years after being granted), however, citations are only observed up to the end of 2010. Hall et al. (2001) suggest two methods for correcting for this bias: (1) the fixed effects method and (2) the quasi-structural method. The fixed effects method involves scaling the number of citations a patent receives by the average number of citations received by patents in the same year and/or technology subcategory. The quasi-structural approach involves estimating the distribution of the citation lag. Based on this distribution, adjustment factors are calculated to scale up the observed citations. The adjustment factors provided by the NBER patent database are for a sample concluding in 2006. Since the sample being analysed has been extended by four years (up to 2010), following Gu et al. (2014), the NBER adjustment factors are shifted forward four years. These methods of adjusting for truncation citation provides noisy estimates for the first few years after the patent is granted (Hall et al., 2001, 2005). However, excluding the final two years of patent data will help to mitigate some of the noise associated with these truncation adjustments.

Based on the approaches suggested by Hall et al. (2001), two measures of citations are calculated. *Citations (Fixed)* is the number of citations per patent adjusted for year and technology class fixed effects. *Citations (Quasi)* is the number of citations per patent where the citations are adjusted using the quasi-structural approach. Due to the skewed nature of the underlying distributions, the natural log of one plus the number of patents and citations per patents are used throughout the analysis.

The number of citations received by a patent serves as a proxy for the underlying value. Kogan et al. (2017) develop a measure of the value added by a patent based on the stock market response to the issuance of a patent. Kogan et al. (2017) have provided their estimates of the value added by each patent.[46] Since prior research has found that the number of citations is positively associated with the value of a patent (see Hall et al., 2005; Kogan et al., 2017), the Kogan et al. (2017) measure of the economic value added by a patent is expected to provide similar results to the citation measures. *Value Added* is calculated as the natural log of one plus the average economic value added by patents produced in year *t*. This *Value Added* variable is useful for assessing the robustness of the results.

4.3.1.3 Innovative Efficiency

Hypothesis 3 predicts that innovative efficiency will improve after the filing of a class action. To test this, two innovative efficiency measures are calculated that take into consideration both the inputs and outputs of the innovative process. Following Hirshleifer et al. (2013), the first measure of innovative efficiency is the number of patents granted scaled by its R&D capital at the end of year *t*.[47]

$$IE_{Patents,t} = Patents_t/(R\&D_t + 0.8 * R\&D_{t-1} + 0.6 * R\&D_{t-2} + 0.4 * R\&D_{t-3} + 0.2 * R\&D_{t-4}) \quad (4.1)$$

The second measure of innovative efficiency is a measure of patent citations scaled by R&D expenses, which is similar to the measures used by Hirshleifer et al. (2013), Gu (2005) and Pandit et al. (2011). Specifically, it is the number of citations received for patents that were applied for in the prior five years scaled by the R&D expenses accrued between year *t-1* and year *t-5*.

$$IE_{Citations,t} = \sum_{j=1}^{5} Citations_{t-j}/(R\&D_{t-1} + R\&D_{t-2} + R\&D_{t-3} + R\&D_{t-4} + R\&D_{t-5}) \quad (4.2)$$

[46] These are available from https://iu.app.box.com/v/patents.
[47] R&D capital is the 5 year cumulative R&D expenses assuming an annual depreciation rate of 20%.

Two variations of the innovative efficiency measure (*IE Citations (Fixed)* and *IE Citations (Quasi)*) are calculated based on the two adjustments for citation truncation outlined in the previous section. These innovative efficiency measures are set up with a lag of five years to effectively capture the length of a development cycle and the associated benefits (Lev and Sougiannis, 1996). The natural log of one plus the innovative efficiency measures is calculated and used throughout the analysis.

Overall, a total of eight measures of innovation are used in this chapter. They include one measure of innovative inputs (*R&D/Assets*), one measure of innovative outputs (*Patents*), two measures of the quality of patents (*Citations (Fixed)* and *Citations (Quasi)*), one measure of the economic value of patents (*Value Added*) and three measures of innovative efficiency (*IE Patents*, *IE Citations (Fixed)* and *IE Citations (Quasi)*). These various measures of innovative activities have been used throughout the analysis to give a full understanding of the relationship between innovation and misconduct.

4.3.2 Innovation and SCA Probability

The first hypothesis predicts that firms that innovate, relative to those that do not innovate, will be more likely to be sued as a result of having more opportunities to commit misconduct. To test this supposition, the following logit regression was estimated for all firms with available data.

$$Sued_t = \beta_0 + \beta_1 InnovDum_{t-1,t-3} + \Sigma\beta \cdot Controls_{t-1} + \varepsilon_t \quad (4.3)$$

The dependent variable (*Sued*) equals one if a firm was sued in year *t* and is equal to zero otherwise. As in Chapter 2, the filing of a SCA was selected as the date used for the analysis undertaken in this chapter for several reasons (see section 2.3.1.1). First, using the filing of a SCA as the key analytical date has the advantage that it is an easily identifiable exogenous event, which represents an accusation of misconduct. Second, the other events associated with the discovery of misconduct typically occur only shortly before the filing of a class action. Finally, using the filing of a class action to analyse the occurrence of misconduct and surrounding changes is a standard approach used in the literature (e.g. McTier and Wald, 2011; Humphery-Jenner, 2012).

The key independent variable of interest is *InnovDum* which is a dummy variable that is equal to one if a firm had undertaken some form of innovative activity in the prior three

years (between *t-1* and *t-3*). A dummy variable is used for this part of the analysis since the primary focus is on whether, in general, innovative firms are more likely to be sued. The second part of the analysis takes into account the level of a firm's innovative success.

The *InnovDum* dummy variable is a measure of innovative input and output. Specifically for innovative input, the *InnovDum* is equal to one if a firm spent any amount on R&D in the prior three years. The measure of innovative outputs is equal to one if a firm received at least one patent in the preceding three year period. The three year window was selected to effectively capture whether a firm was innovating from the beginning of the class period through to the filing of the SCA.[48] If Hypothesis 1 is correct then the coefficient for the *InnovDum* will be positive, which would indicate that firms are more likely to be sued if they are innovating.

The control variables that were used in this model are similar to those that have been used in prior research (e.g. McTier and Wald, 2011; Kim and Skinner, 2012). The controls include: *Size*, *Leverage*, *ROA*, *Return*, book-to-market (*B/M*), proportion of assets that are tangible (*Tangibles*), *Dividends*, standard deviation of the daily returns (*Std Ret*), the beta of the daily returns from the market model (*Beta*) and the skewness of returns (*Skew*). The control variables are all lagged by one year relative to the dependent variable to alleviate endogeneity concerns. Industry and year fixed effects are also controlled for throughout the analysis.[49] See Table 4.1 for an overview of the variables used and how they were calculated.

4.3.3 Innovative Success and SCA Probability

Hypothesis 2 predicts that, among firms that innovate, firms that are innovating less successfully will be more likely to commit misconduct, as a result of facing greater pressures to perform. To test this expectation, another logit model was estimated on all innovating firms.[50]

$$Sued_t = \beta_0 + \beta_1 Innovation_{t-1,t-3} + \Sigma\beta \cdot Controls_{t-1} + \varepsilon_t \quad (4.4)$$

[48] In the sample used for this analysis the average time between the beginning of the class period and the filing of the SCA is approximately 513 days (*Days in CP* plus *Days to File* reported in Table 4.2).
[49] Fama and French (1997) definitions of 48 industries were used to control for industry fixed effects.
[50] Firms are defined as innovating firms if they have spent any amount on R&D or received at least one patent in the prior three years.

This is a similar setup to equation (4.3), but differs by looking at whether the level of innovation is associated with the likelihood of being sued, among firms that are innovating. In equation (4.4) the key independent variable is *Innovation*. *Innovation* is one of eight measures of a firm's innovative activity.[51] The first measure is an estimate of the amount being invested in innovation. It is the total amount spent on R&D in the prior three years scaled by the firm's assets at the beginning of year *t-3*.

The other measures of innovation are based on firm patenting activities and the innovative efficiency. Firm patenting activity is measured by: the number of patents (*Patents*), the average number of citations per patent (*Citations (Fixed)*, *Citations (Quasi)*) and the average economic value added per patent (*Value Added*) in the prior three years. Finally, the average of the three innovative efficiency measures (*IE Patents*, *IE Citations (Fixed)* and *IE Citations (Quasi)*) are calculated for the preceding three year period (*t-1* to *t-3*) and used in equation (4.4).

Hypothesis 2 predicts that less innovative firms are more likely to commit corporate misconduct. If this hypothesis is correct then the coefficient for the *Innovation* variable will be negative for the measures of innovative output and efficiency.

The control variables used in this model are the same as those that were used in equation (4.3).

4.3.4 Innovation Post-Filing

Hypothesis 3 predicts that innovative efficiency will improve after the filing of a class action. Specifically, it is expected that innovative efficiency will improve in the five years following the filing. For this analysis, a sample of control firms was selected using propensity score matching (PSM) method.[52] The propensity score is the probability of a class action being filed based on observable characteristics. The sample of matched firms is obtained by selecting five non-sued firms with the closest propensity scores within the same two digit SIC industry.[53] Firm-year observations for both sued (treatment) and non-sued (control) firms are then retained for the eleven year window around the filing year (from *t-5* to *t+5*).

[51] See section 4.3.1 for the full details on the innovation measures and how they were calculated.
[52] The PSM method implemented in this chapter is the same approach that was used in the robustness tests in Chapter 2 (see Section 2.4.4).
[53] Using a one to one matched sample provides quantitatively similar results.

To test hypothesis 3, the following OLS regression (equation (4.5)) was estimated on the sued and corresponding matched firms for the five years before and after the filing.

$$Innovation_{t+1} = \beta_0 + \beta_1 Immediate + \beta_2 Post + \beta_3 Sued + \beta_4 Immediate * Sued + \beta_5 Post * Sued + \Sigma\beta \cdot Controls_t + \varepsilon_t \quad (4.5)$$

The dependent variable (*Innovation*) is one of the eight measures of innovative activity outlined in section 4.3.1. The diff-in-diff approach used in equation (4.5) is helpful in assessing causality. *Immediate* is a dummy variable that equals one if a firm-year observation occurs in the filing year or up to two years after the filing (year *t* to *t+2*). *Post* is a dummy that equals one if a firm-year observation falls between three to five years after the filing (year *t+3* to *t+5*). The omitted group in this model is the pre-filing period (i.e. year *t-5* to *t-1*). The two key independent variables are the interaction terms *Immediate*Sued* and *Post*Sued*.

The filing of a class action is likely to have an immediate impact on a firm's investment in its innovative activity (*R&D/Assets*) (see Autore et al., 2014; Yuan and Zhang, 2014). As such, if the filing of a class action drives innovative investment decisions this will be evident in the *Immediate*Sued* interaction term.

Due to the long development cycles associated with innovative projects, it is expected that any impact on innovative outputs or efficiency is unlikely to be evident in the period immediately following the filing of a class action. Therefore if the filing of a class action does have an impact on outputs or efficiency, this will be evident in the *Post*Sued* interaction term. If Hypothesis 3 is correct and innovative efficiency improves after a firm is sued then the *Post*Sued* interaction term will have a positive coefficient, when the efficiency measures are analysed

The control variables that are used in this part of the analysis are similar to those that have been used in the literature (see Atanassov, 2013; Fang et al., 2014). The controls include: *Size*, *Leverage*, *ROA*, *B/M*, *Tangibles*, and *R&D/Assets*. Prior research has found that competition is associated with the level of firm innovation (see Aghion et al., 2005; Balakrishnan and Darendeli, 2017). As such, industry concentration is also controlled for using the Herfindahl index (*H-Index*). Nonlinear effects of industry concentration are also controlled for with the square of the Herfindahl index ($H\text{-}Index^2$). Finally, firm and year fixed effects are also used to control for firm and year level variation.

4.3.5 Data

4.3.5.1 Sample Selection

The patent data set used in this analysis was assembled by Kogan et al. (2017).[54] Kogan et al. collected U.S. patent documents from Google Patents and constructed a database consisting of all successfully granted patents up to the end of 2010. The Kogan et al. (2017) patent data set includes information on the filing date, grant date, citations and value added for all granted patents. The final two years of patent data (2009 and 2010) are excluded from the sample to help mitigate issues associated with truncation (see section 4.3.1.2). The citation lag distribution based truncation adjustment factor was also obtained from the NBER patent database, which was assembled by Hall et al. (2001).

As was the case in Chapter 2 and Chapter 3, the data for SCAs that were filed in the United States have been obtained from the Stanford Securities Class Action Clearinghouse (SCAC).[55] All class actions filed between 1996 and 2007 are used, which allows at least one year of data post-filing. To be included in the sample, firm financial data needs to be available for the year preceding and the year following the filing of a class action. After excluding firms in the financial sector (SIC codes 6000 to 6799) and utilities (SIC codes 4900 to 4949), a sample of 1,168 SCAs remains. All firm financial data has been obtained from the CRSP/Compustat merged database.

4.3.5.2 Sample Statistics

Table 4.2 provides a comparison of the sample of sued firms and non-sued firms for the period of 1996 to 2007. Consistent with Hypothesis 1, sued firms are significantly more likely to be involved in the innovative process than non-sued firms. Fifty percent of sued firms received at least one patent in the prior three years, whereas only 33% of non-sued firms received at least one patent during the same period. Consistent with sued firms being more innovative, the proportion of tangible assets is significantly lower for sued firms (0.33) than non-sued firms (0.48). This difference also suggests that sued firms have

[54] https://iu.app.box.com/v/patents
[55] http://securities.stanford.edu

higher information asymmetry, which may provide more opportunities to commit misconduct.

Sued firms also produce significantly more patents than non-sued firms. Interestingly, the two citation measures (*Citations (Fixed)* and *Citations (Quasi*)) and the *Value Added* measure are significantly higher for sued firms indicating they are producing more valuable patents, on average. However, two of the innovative efficiency measures (i.e. *IE Patents* and *IE Citations (Fixed)*) are significantly lower for sued firms relative to non-sued firms. This finding indicates that sued firms have poorer innovative efficiency in the period before the filing, which is consistent with Hypothesis 2.

Table 4.3 compares firm and class action characteristics for sued firms that received at least one patent in the three years prior to the filing and for sued firms that did not receive a patent in the same pre-filing period. Sued firms that had a patent granted are larger in size, have fewer tangible assets and invest more in R&D than sued firms without a patent. Sued firms that received at least one patent in the three years prior to filing are also significantly less likely to have to settle a class action filed against them. The lower probability of settlement can most likely be explained by higher information asymmetry, as indicated by the lower proportion of tangible assets, which makes it relatively more difficult to prove misconduct has occurred.

Table 4.4 provides a breakdown of the sample of sued firms by year and industry. The number of class actions filed in each year is relatively stable over the sample period. There was a slight increase in class actions filed in the early 2000's coinciding with the tech bubble and the Sarbanes-Oxley Act (SOX). Panel B of Table 4.4 shows the number of class actions in the sample by industry. The proportion of sued firms that received at least one patent in the three years prior to filing within each industry is approximately 50%. Sued firms within the business equipment or manufacturing industries are relatively more likely to have obtained a patent (64.5% and 65.8% respectively) whereas sued firms in the retail and wholesale industry or others are relatively less likely to have obtained a patent (23.7% and 25.2%).[56]

Table 4.5 reports a Spearman correlation matrix and variance inflation factors (VIFs) for the primary independent variables that are used throughout the analysis. Most of the

[56] Industry definitions are based on the Fama and French 12 industries. The business equipment industry includes: computers, software and electronic equipment. Industries falling into the other category include: mines, construction, transportation, hotels and entertainment.

correlation coefficients and VIFs are relatively small indicating that multicollinearity is unlikely to be an issue.

4.4 Results

4.4.1 Innovation and SCA Probability

The first hypothesis predicts that firms that are involved in innovative activities are more likely to commit misconduct as a result of having more opportunities. To test this conjecture, a logit regression was estimated using equation (4.3), where the dependent variable equals one if a firm was sued in year *t* and is zero otherwise. Table 4.6 presents the results obtained from these regressions.

The primary variables of interest are the dummy variables for patenting activity (*Dummy Patent (3 Year)* and *Dummy Patent (5 Year)*) and investment in innovation (*Dummy R&D (3 Year)*). These variables are equal to one if a firm has either received a patent or have an R&D expenditure in the prior three or five years. The coefficient for the R&D dummy is positive and statistically significant. This indicates that firms that are involved in the innovative process are more likely to be sued, which is consistent with expectations.

The dummy variable for patenting activity in the prior three years (*Dummy Patent (3 Year)*) is also positive and significant, although only marginally. This finding is also consistent with innovative firms having a higher probability of facing litigation. However, this result no longer holds when the time period for categorising the dummy variable is extended from three to five years (*Dummy Patent (5 Year)*).

Overall, the results are consistent with Hypothesis 1 and suggest that firms that are investing in the innovative process are more likely to be sued. The most likely reason for this finding is the relatively higher level of information asymmetry associated with firms that are innovating (Aboody and Lev, 2000), which may provide more opportunities to commit misconduct. The likelihood of being sued is only marginally positively associated with whether a firm obtained a patent in the prior three years, which can be seen as a basic measure of innovative success. As such, these findings seem to partially support Hypothesis 2.

4.4.2 Innovative Success and SCA Probability

Hypothesis 2 predicts that among firms that are innovating there will be an inverse relationship between innovative success and the probability of being sued. This expectation is based on firms that are failing to innovate facing greater pressures to commit misconduct. To test this, another series of logit regressions were estimated on innovating firms, as in equation (4.4).

The results from these regressions are reported in Table 4.7. The innovative input measure (*R&D/Assets*) has a significant and negative regression coefficient. This finding suggests that as a firm's R&D expenditures increase relative to its assets the probability of facing a class action declines. This result is particularly interesting when taken together with the findings from the previous section (Table 4.6). Firms appear to be more likely to be sued if they have some form of R&D expenditure. However, as R&D expenditures increase, the probability of being sued declines. This result may be driven, in part, by firms achieving greater innovative success the more they invest in R&D.

The results also indicate that as the number of patents (*Patents*) increases the likelihood of facing a SCA declines. This is consistent with Hypothesis 2 and suggests that as innovative success improves the chance of managerial misconduct decreases. This result is also supported by the negative coefficient for the *Value Added* variable, which suggests that the probability of being sued falls as the average value of patents being produced increases.

However, the two citation measures (*Citations (Fixed)* and *Citations (Quasi)*) are not associated with the probability of being sued. This is in contrast to the findings of the value added measure, as the number of citations is typically used as a proxy for the economic value of a patent. Prior research has found that citations are positively associated with firm value (see Hall et al., 2005; Kogan et al., 2017). This positive association is also evident in the correlation matrix (Table 4.5) where the correlation between *Value Added* and the two citation measures are both significantly positive (0.61 and 0.67). Since the correlations are not perfectly positive the two citation measures and the Value Added measure appear to be capturing slightly different factors, which would explain the differences in the results reported in Table 4.7.

Finally, none of the three innovative efficiency measures are significantly associated with the probability of litigation. These results indicate that the level of innovative outputs

(*Patents*) is associated with the likelihood of being sued but not with how efficient a firm is at producing those outputs. Overall, these findings are partially consistent with Hypothesis 2 and suggest that innovative firms may face greater pressures to commit misconduct when they are unable to innovate successfully.

At this point the results indicate that firms that are more innovative will be less likely to commit misconduct. However, this analysis doesn't take into consideration a firm's innovative success relative to its peers. To account for this, the results were re-estimated using the level of innovation over the prior 3 years (*t-3* to *t-1*) for firm *i* less the industry average level of innovation during the same period as the independent variables. The results from these regressions are presented in Table 4.8. Using this relative measure of innovation provides quantitatively similar results to those reported in Table 4.7. The industry adjusted measures of innovative inputs (*R&D/Assets*), innovative outputs (*Patents*) and estimated average value added by patents (*Value Added*) are all negatively related with the probability of being sued. The other industry relative measures of innovation are either unrelated or are marginally positively related (*Citations (Fixed)* and *IE Patents*) to the likelihood of a SCA. These positive relations suggest that the higher the average number of citations or the more innovatively efficient firms are at producing patents, the more likely the firms are to be sued, which conflicts with Hypothesis 2. However, considering the marginal significance of these findings it is difficult to read too much into these findings.

It is also possible that the pressure to commit misconduct will be more prevalent if a firm is struggling to innovate relative to its past innovative success. To account for this, the results were re-estimated using the change in the innovation measures over the prior three years (change from *t-3* to *t-1*) and the change in innovation relative to the industry average change over the same period. The results for these two setups can be found in Appendix C.1 and Appendix C.2. The only innovation variable that is significant in both of these models is the *Value Added* measure. These findings suggest that as the relative average economic value of patents increases, firms are less likely to face a class action. Alternatively, if firms are struggling to continue to produce valuable innovations they are more likely to be sued. This higher probability of litigation could stem from managers facing greater pressures, which results in the violation of securities laws. Although the *Value Added* measure is the only variable that is significant, these findings are consistent with Hypothesis 2 as well as the results reported in Table 4.7.

Overall, the results reported so far indicate that firms that are innovating are more likely to be sued. However, as innovative success improves the incidence of managerial misconduct declines. These findings suggest that a firm's innovative activities can have an impact on the likelihood of corporate misconduct occurring.

4.4.3 Innovation Post-Filing

The final hypothesis predicts that innovative efficiency will improve post-filing. To test this conjecture, a sample of control firms was selected using propensity score matching. For each sued firm a sample of five non-sued firms was selected with the closest propensity scores in the same two digit SIC industry. A comparison of the two samples characteristics in the year prior to the filing (*t-1*) is reported in Table 4.9. With the exception of *Value Added*, which is only marginally significant, the firm characteristics and the measures of innovation are quantitatively similar between the treatment and control firms.

To assess the impact of the filing of a class action on firm innovation, diff-in-diff regressions were estimated, as in equation (4.5). The results from these regressions are presented in Tables 4.10 to 4.17. Each table presents estimates obtained from regressions estimated for one of the eight innovation measures. For brevity and ease of interpretation, the regressions reported are for cases that were settled.[57] The two interaction terms (*Immediate*Sued* and *Post*Sued*) are the primary variables of interest and provide an understanding of both the short- and long-term effects that the filing of a class action has on a firm's innovative activities.

Three separate regressions are reported in each table. The first column (*All*) presents regressions that were estimated for all sued cases that were settled and the corresponding sample of matched firms. This sample was then split into two based on whether the sued firm was involved in any innovative activity in the three years prior to the filing.[58] Two models were then estimated for the subsample of sued firms that had obtained a patent (*Patent Pre-Filing*) and for those that had not obtained a patent (*No-Patent Pre-Filing*) before being sued. These two models were estimated using the sued firms that fell into

[57] A full breakdown of regressions estimated on all class actions, as well as dismissed and settled cases can be found in Appendix D.1 to Appendix D.8.
[58] Specifically, if a firm had obtained at least one patent in the three years prior to the filing they fall into the *Patent Pre-Filing* category.

each category as well as the corresponding matched firms. By splitting the sample based on innovative activities pre-filing, a better understanding of managers' response to the filing can be ascertained.

Table 4.10 presents results obtained when the ratio of R&D to assets was the dependent variable. The *Immediate*Sued* term is negative and significant for the regressions estimated on all settled cases (*All*) and for the subsample that had obtained a patent pre-filing (*Patent Pre-Filing*). R&D is a measure of innovative input, and as such, this finding suggests that immediately following the filing of a class action, sued firms are investing significantly less in innovation. This finding is consistent with expectations as well as prior research (Autore et al., 2014; Yuan and Zhang, 2014). Unsurprisingly, for the subsample of firms that had not obtained a patent before being sued (*No-Patent Pre-Filing*), the *Immediate*Sued* is not significantly associated with the amount spent on R&D. The coefficient for the *Post*Sued* term is not significant in any of the models. This suggests that any impact that the filing of a class action has on the amount invested in innovation is likely to be only short-term.

The next innovation measure that was analysed was the number of patents (Table 4.11). For regressions that were estimated for all settled class actions (*All*), neither the *Immediate*Sued* nor the *Post*Sued* are statistically significant. For sued firms that had obtained a patent pre-filing (*Patent Pre-Filing*), a significant negative coefficient is found for *Post*Sued* interaction term but the *Immediate*Sued* term is insignificant. This indicates that sued firms produce fewer patents between three to five years after the filing of a class action but patenting activity is unaffected immediately following the filing. This reduction in the number of patents is also consistent with the drop in R&D as observed in Table 4.10. As such, it appears that investment in innovation declines immediately following the filing and subsequently there is a decline in the number of patents obtained, which coincides with the length of a development cycle (see Section 4.3.1.3).

Interestingly, for the sued firms that had not obtained a patent pre-filing (*No-Patent Pre-Filing*), both *Post*Sued* and *Immediate*Sued* interaction terms are significantly positively related to the number of patents. This indicates that the number of patents obtained by a firm increases after being sued. One possible explanation for this finding is that these sued firms were struggling to innovate before being sued but have a number of innovative projects come to fruition after the filing. In this scenario, the observed increase in the number of patents is not causally related to the filing and just reflects the nature of

the innovative development process. Alternatively, it may reflect a more concerted effort by the managers to obtain patents. However, the subsample of sued firms without a patent pre-filing (*No-Patent Pre-Filing*) do not appear to be investing more in innovative activities post-filing. As such, the increase in patenting may stem from the discipline being imposed by the filing of a class action.

Table 4.12 and Table 4.13 report the results when the dependent variable is one of the two measures of citations (*Citations (Fixed)* and *Citations (Quasi)*). For the full sample of settled class actions, the filing of a class action does not appear to have a significant impact on the number of citations. For the sued firms that had obtained a patent pre-filing (*Patent Pre-Filing*) sample, *Immediate*Sued* and *Post*Sued* interaction terms are significantly negatively related to the *Citations (Quasi)* measure but not to *Citations (Fixed)*. The coefficient is more significantly negative for the *Post*Sued* variable (-0.256) as compared to the *Immediate*Sued* (-0.148) when *Citations (Quasi)* is the dependent variable. This would indicate that after being sued the average quality of patents obtained by sued firms declines. It is likely that managers are taking fewer risks with their innovative activities post-filing. As such, firms may be focusing more on safer projects. However, this association is only evident for *Citations (Quasi)* and not *Citations (Fixed*).

For both measures of citations, the two interaction terms are positive and significant for the *No-Patent Pre-Filing* regressions. As previously mentioned for the analysis of the number of patents, there are two possible explanations for this finding. It could be a result of the nature of development process or it could reflect improved discipline. Appendices D.2 to D.4 report full results where the dependent variable is the number of patents and the two citation measures for the full sample of class actions as well as the dismissed and settled subsamples. The *Immediate*Sued* and *Post*Sued* terms for the sued firms without a patent pre-filing (*No-Patent Pre-Filing*) dismissed sample have similar coefficients and levels of significance with the settled cases. This indicates that the merits of the case do not matter and the same trend is observed irrespective of whether managers have committed misconduct. Hence, the observed positive relation is unlikely to be a result of improved discipline being imposed by the filing of a class action.

When *Value Added* is the dependent variable, the two interaction terms are not significant for the model estimated on all settled cases and the sample that had obtained a patent pre-filing (*Patent Pre-Filing*). The *Post*Sued* term is negative and marginally significant for the sample of sued firms that had not obtained a patent pre-filing filing (*No-*

Patent Pre-Filing). However, due to the marginal significance of the result and the evidence already reported, this finding is difficult to interpret. Overall, the filing of a class action does not appear to have a significant impact on the average quality of patents.

Finally, the impact of the filing of a class action on the three measures of innovative efficiency was analysed. The results of these regressions are reported in Tables 4.15 to 4.17. Both *Immediate*Sued* and *Post*Sued* interaction terms are not significant in any of the models reported in these tables. Contrary to expectations, the results suggest that innovative efficiency is unaffected by the filing of a SCA.

One possible reason for not finding a significant relationship could be the substantial number of lagged years used to calculate the innovative efficiency measures. However, re-estimating the models using innovative efficiency measures using three years of lagged data as opposed to five years (equations (4.1) and (4.2)) provides quantitatively similar results.[59]

Overall, the findings indicate that if a firm was innovating successfully before being sued, the filing of a class action has an immediate impact on the amount invested in innovation. However, the decrease in R&D expenditures is only evident for up to two years following the filing. The results also indicate that the quantity of patents received declines between three to five years following the filing of a class action. The impact the class action has on the quality of the patents is less clear. The overall quality of innovation appears to be either unaffected or to decline post-filing. Finally, innovative efficiency appears to be unaffected by shareholder litigation. The filing of a class action, therefore, appears to cause changes in a firm's innovative activities. From this analysis, it is unclear whether these changes are a negative side effect stemming from the disruption caused by a SCA or a benefit as a result of improved discipline post-filing. As such, future research could further examine whether these observed changes in innovative activities are beneficial.

4.5 Conclusion

This chapter examines the relationship between corporate innovation and SCAs. The results reported indicate that firms involved in innovative activities are more likely to be

[59] Results are not reported.

sued. The higher propensity for being sued is primarily related to whether firms are actively investing in innovative activities. It is argued that greater information asymmetry provides more opportunities to managers of innovative firms to commit misconduct.

Among firms that innovate, more innovatively successful firms are found to be less likely to face a SCA. Alternatively, firms that are struggling to innovate are more likely to be accused of corporate misconduct. This finding is consistent with managers of innovative firms facing greater pressures to violate securities laws if they are unable to remain innovatively competitive. These findings extend the current understanding of the causes of SCAs. Market participants, therefore, need to be wary of this potential negative consequence of the innovative process. As such, the results will be useful for future detection and the possible prevention of corporate misconduct

After being sued, firms that had obtained at least one patent pre-filing decrease the amount invested in innovative projects in the short-term, which results in a decline in innovative outputs several years later. The overall quality of patents being produced by sued firms appears to be similar or slightly worse post-filing. However, innovative efficiency does not appear to be impacted.

This research is the first to explicitly examine the association between innovation and corporate misconduct. The evidence reported suggests that innovative activities impact both the opportunities and the pressures to violate securities laws. The filing of a class action appears to have a tangible impact on innovative activities although whether these changes are beneficial remains unclear. Overall, this study highlights two important facets of innovating firms that stakeholders and regulators need to be aware of: (1) the higher risk of impropriety and (2) the potential consequences a resulting class action could cause.

Table 4.1: Variable Definitions

Panel (A): Innovation Related Variables	
Variable	Definition
R&D/Assets	Ratio of R&D expenditures to the firms total assets.
Patents	Natural log of one plus the number of patents.
Citations (Fixed)	Natural log of one plus the number of citations per patent scaled by the average number of citations received by patents granted in the same year and technology subcategory.
Citations (Quasi)	Natural log of one plus the number of citations per patent is multiplied by an adjustment factor based on the citation lag distribution.
Value Added	Natural log of one plus the average value added by patents granted in year t (value added measure has been obtained from the Kogan et al. (2017) data set).
IE Patents	A measure of Innovative Efficiency developed by Hirshleifer et al. (2013) calculated as the number of patents granted scaled by its R&D capital at the end of year *t*. Where the R&D capital is the five year cumulative R&D expenses assuming an annual rate of depreciation of 20%.
IE Citations (Fixed)	A measure of Innovative Efficiency calculated as the sum of the Citations (Fixed) for patents that were granted over the prior five years scaled by R&D expenses accrued between *t-1* and *t-5*.
IE Citations (Quasi)	A measure of Innovative Efficiency calculated as the sum of the Citations (Quasi) for patents that were granted over the prior five years scaled by R&D expenses accrued between *t-1* and *t-5*.
Panel (B): Other Variables	
Immediate	A dummy variable equal to one if the firm-year is between the year a class action was filed and up to two years after the filing of a class action (year *t* to *t+2*).
Post	A dummy variable equal to one if the firm-year is between three to five years after the filing of a class action (year *t+3* to *t+5*).
Sued	A dummy variable equal to one if the firm was sued.
Size	Natural log of the firm's market capitalisation.
Leverage	Ratio of total book value of current and long term debt to market capitalisation.
ROA	Ratio of net income to assets.
Return	Annual return on the firm's stock.
B/M	Ratio of common equity to market capitalisation.
Tangibles	Ratio of the gross plant property and equipment (PPE) to total assets.
Dividends	Ratio of total ordinary share dividends paid to total assets.
Std Ret	Standard deviation of the firm's daily stock returns.
Beta	The beta for the market model obtained by regressing the firm's daily stock returns against the returns of the CRSP value weighted index.
Skew	Skewness of the firm's daily stock returns.
H-Index	Herfindahl Index based on the annual sales within each 4 digit SIC industry.
H-Index^2	The square of the H-Index.

Table 4.2: Comparison of Sued and Non-Sued Firms

Table 4.2 reports descriptive statistics for sued and non-sued firm-year observations between 1996 and 2007. The table includes the mean and number of observations for the selected variables. The means are winsorised at the 1st and 99th percentiles. The difference between the two samples are calculated as the mean of the sued firms variable less the mean of the non-sued firms variable and these are shown in the last column with significance calculated using a paired t-test. Variables definitions can be found in Table 4.1. *, **, *** Statistically different from zero at the 10, 5 and 1 percent significance levels, respectively.

	Sued		Non-Sued		
	Mean	N	Mean	N	Difference (Sued-NonSued)
Firm Characteristics					
Market Cap	4,966.27	1,168	1,476.66	67,640	3,489.61***
Assets	3,736.63	1,168	2,404.67	67,640	1,331.95
Leverage	0.19	1,168	0.22	67,640	-0.03***
PPE/Assets	0.33	1,168	0.48	67,640	-0.15***
B/M	0.65	1,168	1.83	67,640	-1.18
ROA	-0.08	1,168	-0.06	67,640	-0.02
Return	0.18	1,168	0.17	67,640	0.02
R&D/Assets	0.10	840	0.10	37,821	0.01
SCA Info					
Settled	0.65	1,168			
Days In CP	397.72	1,167			
Days to File	115.45	1,167			
Days to Outcome	1,369.84	1,168			
Innovation(Prior 3 Years)					
% Received a Patent	0.50		0.33		0.17*
Patents	1.34	1,168	0.77	67,640	0.57***
Citations (Fixed)	0.40	1,168	0.22	67,640	0.19***
Citations (Quasi)	1.57	1,168	0.91	67,636	0.66***
Value Added	1.88	584	1.40	22,508	0.48***
IE Patents	0.37	513	0.44	18,896	-0.07***
IE Citations (Fixed)	0.71	521	0.77	19,464	-0.07*
IE Citations (Quasi)	2.79	521	2.82	19,461	-0.03

Table 4.3: Comparison of Sued Firms with a Patent and Sued Firms without a Patent

Table 4.3 reports descriptive statistics for sued firms split by innovative activities. If a firm obtained at least one patent in the three years prior to the filing of a class action they are fall into the *Patent Pre-Filing* group. The table presents the mean and number of observations for the selected variables. The means are winsorised at the 1st and 99th percentiles. The difference between the two samples are calculated as the mean of the sued innovator firms variable less the mean of the sued non-innovator firms variable and these are shown in the last column with significance calculated using a paired t-test. Variables definitions can be found in Table 4.1. *, **, *** Statistically different from zero at the 10, 5 and 1 percent significance levels, respectively.

	Patent Pre-Filing		No Patent Pre-Filing		
	Mean	N	Mean	N	Difference (Patent-NoPatent)
Firm Values					
Market Cap	8,740.54	584	1,510.87	584	7,229.67***
Assets	5,867.49	584	1,657.28	584	4,210.21***
Leverage	0.17	584	0.22	584	-0.06***
PPE/Assets	0.31	584	0.35	584	-0.04***
B/M	0.58	584	0.71	584	-0.14
ROA	-0.10	584	-0.06	584	-0.04*
Return	0.19	584	0.17	584	0.02
R&D/Assets	0.13	513	0.07	327	0.06***
SCA Info					
Settled	0.61	584	0.68	584	-0.07**
Days In CP	396.54	583	398.92	584	-2.38
Days to File	114.58	583	116.18	584	-1.61
Days to Outcome	1,386.61	584	1,352.85	584	33.76

Table 4.4: Sued Firms by Year and Industry

Table 4.4 reports the number of SCAs filed each year and in each industry for the sample of 1168 class actions filed during the period of 1996 to 2007 obtained from the Stanford SCA Clearinghouse. Panel A displays the number and percentage of SCAs filed each year. Panel B reports the frequency of class actions and the number of sued firms that received at least one patent in the three years before the filing by industry.

Panel A: Distribution of Sample across Years		
Year	N	Percent
1996	48	4.1%
1997	91	7.8%
1998	113	9.7%
1999	124	10.6%
2000	87	7.4%
2001	223	19.1%
2002	95	8.1%
2003	83	7.1%
2004	103	8.8%
2005	84	7.2%
2006	52	4.5%
2007	65	5.6%
Total	1,168	

Panel B: Distribution of Class Actions across Industries			
	N	N (Patent Pre)	%Patent Pre
Consumer NonDurables	51	21	41.2%
Consumer Durables	27	17	63.0%
Manufacturing	73	48	65.8%
Energy	23	7	30.4%
Chemicals and Allied	16	9	56.3%
Business Equipment	437	282	64.5%
Telecom	63	19	30.2%
Retail and Wholesale	139	33	23.7%
Healthcare	176	107	60.8%
Other	163	41	25.2%
Total	1,168		

Table 4.5: Correlations

Table 4.5 shows the matrix of Spearman correlation coefficients for the independent variables. Correlations are calculated based on the full sample of sued and non-sued firms analysed. Variance inflation factors (VIFs) are also presented for the independent variables used in equation (4.4). Variables definitions can be found in Table 4.1.

	R&D/Assets$_{t-3,t-1}$	Patents$_{t-3,t-1}$	Citations (Fixed)$_{t-3,t-1}$	Citations (Quasi)$_{t-3,t-1}$	Value Added$_{t-3,t-1}$	IE (Patents)$_{t-3,t-1}$	IE (Citations (Fixed))$_{t-3,t-1}$	IE (Citations (Quasi))$_{t-3,t-1}$	Size	Leverage	ROA	Return	B/M	Tangibles	Dividends	Std Ret	Beta	Skew	VIF
R&D/Assets$_{t-3,t-1}$	1.00																		
Patents$_{t-3,t-1}$	0.64	1.00																	
Citations (Fixed)$_{t-3,t-1}$	0.72	0.94	1.00																
Citations (Quasi)$_{t-3,t-1}$	0.71	0.61	0.67	1.00															
Value Added$_{t-3,t-1}$	0.06	0.13	0.12	0.02	1.00														
IE (Patents)$_{t-3,t-1}$	0.12	0.02	0.09	-0.19	-0.13	1.00													
IE (Citations (Fixed))$_{t-3,t-1}$	0.18	0.31	0.30	-0.06	-0.08	0.72	1.00												
IE (Citations (Quasi))$_{t-3,t-1}$	0.25	0.35	0.41	-0.02	-0.08	0.63	0.91	1.00											
Size	0.40	0.24	0.25	0.55	-0.12	-0.21	-0.12	-0.10	1.00										1.30
Leverage	-0.01	-0.02	-0.02	-0.01	0.06	0.01	-0.01	-0.03	-0.03	1.00									1.07
ROA	0.00	0.00	0.00	0.00	-0.04	0.00	0.00	0.00	0.13	-0.11	1.00								1.12
Return	0.07	0.06	0.07	0.07	-0.10	-0.02	0.00	0.02	0.12	-0.08	0.01	1.00							1.02
B/M	0.01	-0.01	-0.01	-0.02	-0.03	-0.02	-0.04	-0.05	-0.07	-0.01	0.01	0.00	1.00						1.01
Tangibles	-0.03	-0.05	-0.05	-0.02	-0.05	0.02	0.00	-0.01	0.00	0.72	-0.03	-0.10	0.01	1.00					1.03
Dividends	0.00	-0.01	-0.01	0.01	-0.04	-0.03	-0.03	-0.04	0.04	0.00	0.01	0.00	0.00	0.00	1.00				1.04
Std Ret	-0.04	-0.03	-0.03	-0.04	0.06	0.03	0.00	-0.01	-0.10	0.00	0.00	-0.22	0.00	0.00	-0.01	1.00			1.07
Beta	0.00	0.00	0.00	0.00	0.02	-0.01	-0.01	-0.01	0.02	0.00	0.00	-0.07	0.00	0.00	0.00	0.09	1.00		1.01
Skew	-0.05	-0.01	-0.01	-0.05	0.05	0.02	0.03	0.03	-0.13	-0.01	-0.07	0.01	0.00	-0.01	-0.02	-0.15	0.00	1.00	1.06

Table 4.6: Probability of Being Sued if Firm Innovates

Table 4.6 reports logit regression estimates for the probability of a firm being sued, using equation (4.3). The dependent variable in these regressions is a dummy variable equal to one if the firm is sued in year *t*. *Dummy R&D (3 Year)* is equal to one if the firm spend any amount on R&D in the preceding three years. *Dummy Patents (3 Year)* is equal to one if the firm received at least one patent in the prior three years. *Dummy Patents (5 Year)* is equal to one if the firm received at least one patent in the prior five years. Robust standard errors clustered at the firm level are reported in parentheses. Variables definitions can be found in Table 4.1.. *, **, *** Statistically different from zero at the 10, 5 and 1 percent significance levels, respectively.

	Dependent Variable: Sued		
Dummy R&D (3 Year)	0.338***		
	(0.07)		
Dummy Patent (3 Year)		0.103*	
		(0.06)	
Dummy Patent (5 Year)			0.081
			(0.06)
Size	0.336***	0.332***	0.334***
	(0.01)	(0.01)	(0.01)
Leverage	-0.016	-0.050	-0.052
	(0.08)	(0.08)	(0.08)
ROA	-0.095***	-0.103***	-0.103***
	(0.03)	(0.03)	(0.03)
Return	-0.022**	-0.022**	-0.022**
	(0.01)	(0.01)	(0.01)
B/M	0.000	0.000	0.000
	(0.00)	(0.00)	(0.00)
Tangibles	-1.498***	-1.515***	-1.515***
	(0.11)	(0.11)	(0.11)
Dividends	0.072	0.073	0.074
	(0.13)	(0.14)	(0.14)
Std Ret	0.019**	0.019**	0.019**
	(0.01)	(0.01)	(0.01)
Beta	0.005***	0.005***	0.005***
	(0.00)	(0.00)	(0.00)
Skew	-0.162***	-0.161***	-0.161***
	(0.01)	(0.01)	(0.01)
Intercept	-5.645***	-5.484***	-5.488***
	(0.12)	(0.11)	(0.11)
Industry Fixed Effect	Yes	Yes	Yes
Year Fixed Effect	Yes	Yes	Yes
R^2	0.14	0.14	0.14
N	73,429	73,429	73,429

Table 4.7: Probability of Being Sued by Amount of Innovation

Table 4.7 reports logit regression estimates for the probability of a firm being sued, using equation (4.4). The dependent variable in these regressions is a dummy variable equal to one if the firm is sued in year *t*. The eight innovation measures (*R&D/Assets*, *Patents*, *Citations (Fixed)*, *Citations (Quasi)*, *Value Added*, *IE Patents*, *IE Citations (Fixed)* and *IE Citations (Quasi)*) are calculated based on the level of innovative activity being undertaken in the preceding three years. Robust standard errors clustered at the firm level are reported in parentheses. Variables definitions can be found in Table 4.1. *, **, *** Statistically different from zero at the 10, 5 and 1 percent significance levels, respectively.

	Dependent Variable: Sued							
$R\&D/Assets_{i\ t-1,t-3}$	-0.224**							
	(0.09)							
$Patents_{i\ t-1,t-3}$		-0.080***						
		(0.02)						
$Citations\ (Fixed)_{i\ t-1,t-3}$			0.107					
			(0.07)					
$Citations\ (Quasi)_{i\ t-1,t-3}$				0.025				
				(0.02)				
$Value\ Added_{i\ t-1,t-3}$					-0.196***			
					(0.04)			
$IE\ Patents_{i\ t-1,t-3}$						0.151		
						(0.10)		
$IE\ Citations\ (Fixed)_{i\ t-1,t-3}$							0.030	
							(0.06)	
$IE\ Citations\ (Quasi)_{i\ t-1,t-3}$								0.018
								(0.03)
Size	0.331***	0.384***	0.327***	0.328***	0.428***	0.301***	0.320***	0.320***
	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)
Leverage	-0.013	-0.004	0.011	0.006	0.009	-0.036	0.131	0.132
	(0.17)	(0.16)	(0.17)	(0.17)	(0.17)	(0.22)	(0.21)	(0.21)

ROA	-0.247***	-0.219***	-0.199***	-0.200***	-0.217***	-0.227***	-0.218***	-0.218***
	(0.06)	(0.05)	(0.05)	(0.05)	(0.05)	(0.07)	(0.07)	(0.07)
Return	-0.031***	-0.033***	-0.033***	-0.033***	-0.031***	-0.108**	-0.054	-0.054
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.05)	(0.04)	(0.04)
B/M	-0.001	-0.001	-0.002	-0.002	-0.001	-0.011*	-0.010	-0.010
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.01)	(0.01)	(0.01)
Tangibles	-1.799***	-1.713***	-1.806***	-1.815***	-1.770***	-1.704***	-1.372***	-1.373***
	(0.17)	(0.18)	(0.17)	(0.17)	(0.17)	(0.22)	(0.22)	(0.22)
Dividends	-1.980	-1.800	-1.593	-1.640	-1.843	-2.418	-5.447*	-5.443*
	(1.62)	(1.56)	(1.54)	(1.55)	(1.58)	(2.58)	(3.21)	(3.21)
Std Ret	0.022**	0.023**	0.023**	0.023**	0.025**	0.031*	0.042***	0.042***
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.02)	(0.01)	(0.01)
Beta	0.003*	0.003*	0.003*	0.003*	0.003*	0.001	0.001	0.001
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Skew	-0.157***	-0.155***	-0.156***	-0.156***	-0.155***	-0.165***	-0.170***	-0.170***
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.02)	(0.02)	(0.02)
Intercept	-6.820	-7.018	-6.884	-6.884	-7.198	-7.980	-8.581	-8.599
	(39.47)	(25.15)	(39.60)	(39.55)	(24.69)	(99.25)	(60.67)	(60.65)
Industry Fixed Effect	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year Fixed Effect	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Pseudo R^2	0.15	0.15	0.15	0.15	0.16	0.15	0.14	0.14
N	32,028	32,028	32,028	32,024	32,028	19,012	19,402	19,399

Table 4.8: Probability of Being Sued by Amount of Innovation Relative to the Industry

Table 4.8 reports logit regression estimates for the probability of a firm being sued, using equation (4.4). The dependent variable in these regressions is a dummy variable equal to one if the firm is sued in year *t*. The eight innovation measures (*R&D/Assets*, *Patents*, *Citations (Fixed)*, *Citations (Quasi)*, *Value Added*, *IE Patents*, *IE Citations (Fixed)* and *IE Citations (Quasi)*) are calculated as the level of innovative activity being undertaken in the preceding three years by firm *i* less the industry average level of innovative activity in the preceding three years. Robust standard errors clustered at the firm level are reported in parentheses. Variables definitions can be found in Table 4.1. *, **, *** Statistically different from zero at the 10, 5 and 1 percent significance levels, respectively.

	Dependent Variable: Sued							
$R\&D/Assets_{i\ t-1,t-3}$ - $R\&D/Assets_{ind\ t-1,t-3}$	-0.164*							
	(0.09)							
$Patents_{i\ t-1,t-3}$ - $Patents_{ind\ t-1,t-3}$		-0.074***						
		(0.02)						
$Citations\ (Fixed)_{i\ t-1,t-3}$ - $Citations\ (Fixed)_{ind\ t-1,t-3}$			0.115*					
			(0.07)					
$Citations\ (Quasi)_{i\ t-1,t-3}$ - $Citations\ (Quasi)_{ind\ t-1,t-3}$				0.031				
				(0.02)				
$Value\ Added_{i\ t-1,t-3}$ - $Value\ Added_{ind\ t-1,t-3}$					-0.185***			
					(0.04)			
$IE\ Patents_{i\ t-1,t-3}$ - $IE\ Patents_{ind\ t-1,t-3}$						0.187*		
						(0.10)		
$IE\ Citations\ (Fixed)_{i\ t-1,t-3}$ - $IE\ Citations\ (Fixed)_{ind\ t-1,t-3}$							0.049	
							(0.06)	
$IE\ Citations\ (Quasi)_{i\ t-1,t-3}$ - $IE\ Citations\ (Quasi)_{ind\ t-1,t-3}$								0.021
								(0.03)
Size	0.332***	0.380***	0.326***	0.326***	0.422***	0.301***	0.321***	0.320***
	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)
Leverage	-0.010	-0.004	0.012	0.008	0.008	-0.035	0.132	0.132
	(0.17)	(0.16)	(0.17)	(0.17)	(0.17)	(0.21)	(0.21)	(0.21)

ROA	-0.236***	-0.218***	-0.199***	-0.199***	-0.217***	-0.227***	-0.218***	-0.218***
	(0.06)	(0.05)	(0.05)	(0.05)	(0.05)	(0.07)	(0.07)	(0.07)
Return	-0.031***	-0.033***	-0.033***	-0.033***	-0.031***	-0.108**	-0.054	-0.054
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.05)	(0.04)	(0.04)
B/M	-0.001	-0.001	-0.002	-0.002	-0.001	-0.011*	-0.010	-0.010
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.01)	(0.01)	(0.01)
Tangibles	-1.803***	-1.720***	-1.806***	-1.816***	-1.773***	-1.703***	-1.372***	-1.373***
	(0.17)	(0.18)	(0.17)	(0.17)	(0.17)	(0.21)	(0.22)	(0.22)
Dividends	-1.912	-1.803	-1.579	-1.614	-1.837	-2.407	-5.378*	-5.423*
	(1.61)	(1.56)	(1.54)	(1.55)	(1.58)	(2.57)	(3.21)	(3.21)
Std Ret	0.022**	0.023**	0.023**	0.023**	0.024**	0.031*	0.042***	0.042***
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.02)	(0.01)	(0.01)
Beta	0.003*	0.003*	0.003*	0.003*	0.003*	0.001	0.001	0.001
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Skew	-0.156***	-0.155***	-0.156***	-0.156***	-0.155***	-0.165***	-0.170***	-0.170***
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.02)	(0.02)	(0.02)
Intercept	-6.867	-7.066	-6.859	-6.854	-7.270	-7.920	-8.560	-8.553
	(39.47)	(25.27)	(39.61)	(39.59)	(24.66)	(99.28)	(60.66)	(60.65)
Industry Fixed Effect	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year Fixed Effect	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Pseudo R^2	0.15	0.15	0.15	0.15	0.16	0.15	0.14	0.14
N	32,028	32,028	32,028	32,024	32,028	19,012	19,402	19,399

Table 4.9: Comparison of Sued and Matched Sample

Table 4.9 reports descriptive statistics for sued and matched firm-year observations. The table includes the mean and number of observations for the selected variables. The means are winsorised at the 1st and 99th percentiles. The difference between the two samples are calculated as the mean of the sued firms variable less the mean of the matched firms variable and these are shown in the last column with significance calculated using a paired t-test. Variables definitions can be found in Table 4.1. *, **, *** Statistically different from zero at the 10, 5 and 1 percent significance levels, respectively.

	Sued		Matched		Diff (Sued-Matched)
Firm Values					
Size	6.48	1,168	6.46	5,830	0.02
Leverage	0.19	1,168	0.18	5,830	0.01
ROA	-0.08	1,168	-0.02	5,830	-0.06
Return	0.18	1,168	0.19	5,830	-0.01
B/M	0.65	1,168	0.66	5,830	-0.02
Tangibles	0.33	1,168	0.33	5,830	0.00
Dividends/Assets	0.00	1,168	0.01	5,830	0.00
Std Ret	0.05	1,168	0.11	5,830	-0.06
Beta	1.32	1,168	1.10	5,830	0.21
Skew	0.23	1,168	0.25	5,830	-0.02
Innovation					
Patents	0.90	1,168	0.90	5,830	0.00
Citations (Fixed)	0.30	1,168	0.29	5,830	0.01
Citations (Quasi)	1.15	1,168	1.11	5,830	0.04
Value Added	1.91	455	2.04	2,264	-0.12*
R&D/Assets	0.10	840	0.10	4,058	0.01
IE Patents	0.14	415	0.14	2,082	0.01
IE Citations (Fixed)	0.40	515	0.35	2,560	0.05
IE Citations (Quasi)	2.02	515	1.88	2,560	0.14

Table 4.10: Impact of the Filing of a Class Action on R&D – Settled Cases

Table 4.10 reports OLS regression estimates for the effect the filing of a class action that was settled has on R&D expenditures. The dependent variable in this regression is the ratio of R&D/Assets. The regressions were estimated for a sample of sued and propensity score matching sample of non-sued firms. R&D was analysed for a window of up to five years before and after the filing of a SCA. The first column (*All*) presents results obtained for regressions estimated on all sued and matched firms. The second column (*Patent Pre-Filing*) reports regression estimates for the sample of sued firms that obtained at least one patent in the three years before the filing and the corresponding matched firm. The second column (*No-Patent Pre-Filing*) reports regression estimates for the sample of sued firms that did not obtain a patent in the three years before the filing and the corresponding matched firms. Robust standard errors clustered at the firm level are reported in parentheses. Variables definitions can be found in Table 4.1. *, **, *** Statistically different from zero at the 10, 5 and 1 percent significance levels, respectively.

	Dependent Variable: R&D/Assets		
	All	Patent Pre-Filing	No-Patent Pre-Filing
Immediate	0.002	0.000	0.006
	(0.00)	(0.00)	(0.00)
Post	-0.006	-0.012*	0.006
	(0.00)	(0.01)	(0.01)
Sued	0.010**	0.026***	-0.019***
	(0.00)	(0.01)	(0.01)
Immediate * Sued	-0.026***	-0.031***	-0.016
	(0.01)	(0.01)	(0.01)
Post * Sued	-0.010	-0.008	-0.018
	(0.01)	(0.01)	(0.01)
Size	-0.007***	-0.007***	-0.008***
	(0.00)	(0.00)	(0.00)
Leverage	-0.055***	-0.040***	-0.081***
	(0.01)	(0.01)	(0.01)
ROA	-0.168***	-0.171***	-0.163***
	(0.00)	(0.01)	(0.00)
Return	-0.001	-0.001	-0.002
	(0.00)	(0.00)	(0.00)
B/M	0.000	0.000	0.000**
	(0.00)	(0.00)	(0.00)
Tangibles	-0.015***	-0.031***	0.004
	(0.00)	(0.01)	(0.01)
Dividends	0.012	0.018	0.009
	(0.04)	(0.06)	(0.05)
H-Index	-0.037	-0.154***	0.063*
	(0.03)	(0.05)	(0.03)
H-Index^2	0.027	0.132**	-0.065*
	(0.03)	(0.06)	(0.04)
High-Tech	0.086***	0.059***	0.105***
	(0.00)	(0.01)	(0.00)
Intercept	0.166***	0.235***	0.099***
	(0.01)	(0.02)	(0.01)
Firm Fixed Effect	Yes	Yes	Yes
Year Fixed Effect	Yes	Yes	Yes
R^2	0.20	0.15	0.31
N	21,350	12,500	8,850

Table 4.11: Impact of the Filing of a Class Action on the Number of Patents – Settled Cases

Table 4.11 reports OLS regression estimates for the effect the filing of a class action that was settled has on the number of patents. The dependent variable in this regression is the log of one plus the number of patents. The regressions were estimated for a sample of sued and propensity score matching sample of non-sued firms. The number of patents were analysed for a window of up to five years before and after the filing of a SCA. The first column (*All*) presents results obtained for regressions estimated on all sued and matched firms. The second column (*Patent Pre-Filing*) reports regression estimates for the sample of sued firms that obtained at least one patent in the three years before the filing and the corresponding matched firm. The second column (*No-Patent Pre-Filing*) reports regression estimates for the sample of sued firms that did not obtain a patent in the three years before the filing and the corresponding matched firms. Robust standard errors clustered at the firm level are reported in parentheses. Variables definitions can be found in Table 4.1. *, **, *** Statistically different from zero at the 10, 5 and 1 percent significance levels, respectively.

	Dependent Variable: Patents		
	All	Patent Pre-Filing	No-Patent Pre-Filing
Immediate	-0.060**	-0.024	-0.144***
	(0.02)	(0.03)	(0.03)
Post	-0.004	0.090**	-0.203***
	(0.03)	(0.05)	(0.04)
Sued	0.029	0.273***	-0.557***
	(0.03)	(0.05)	(0.04)
Immediate * Sued	-0.028	-0.081	0.162**
	(0.05)	(0.07)	(0.06)
Post * Sued	-0.022	-0.238**	0.270***
	(0.07)	(0.10)	(0.09)
Size	0.444***	0.526***	0.229***
	(0.00)	(0.01)	(0.01)
Leverage	0.256***	0.218***	0.177***
	(0.04)	(0.06)	(0.05)
ROA	0.092***	0.117***	0.040
	(0.03)	(0.04)	(0.03)
Return	-0.084***	-0.086***	-0.051***
	(0.01)	(0.01)	(0.01)
B/M	0.006***	0.006***	0.014***
	(0.00)	(0.00)	(0.00)
Tangibles	0.642***	1.219***	0.169***
	(0.04)	(0.05)	(0.04)
R&D	0.845***	0.945***	0.503***
	(0.07)	(0.10)	(0.08)
Dividends	1.033***	0.593	0.507*
	(0.25)	(0.37)	(0.27)
H-Index	3.689***	4.101***	1.789***
	(0.21)	(0.33)	(0.22)
H-Index^2	-3.174***	-3.328***	-1.465***
	(0.23)	(0.37)	(0.23)
High-Tech	0.937***	0.842***	0.625***
	(0.03)	(0.05)	(0.03)
Intercept	-3.606***	-4.321***	-1.572***
	(0.07)	(0.11)	(0.08)
Firm Fixed Effect	Yes	Yes	Yes
Year Fixed Effect	Yes	Yes	Yes
R^2	0.35	0.40	0.22
N	21,530	12,583	8,947

Table 4.12: Impact of the Filing of a Class Action on the Number of Citations (Fixed) – Settled Cases

Table 4.12 reports OLS regression estimates for the effect the filing of a class action that was settled has on the number of citations. The dependent variable in this regression is the log of one plus the number of citations per patent scaled by the average number of citations received by patents granted in the same year and in the same technology subcategory. The regressions were estimated for a sample of sued and propensity score matching sample of non-sued firms. The number of citations were analysed for a window of up to five years before and after the filing of a SCA. The first column (*All*) presents results obtained for regressions estimated on all sued and matched firms. The second column (*Patent Pre-Filing*) reports regression estimates for the sample of sued firms that obtained at least one patent in the three years before the filing and the corresponding matched firm. The second column (*No-Patent Pre-Filing*) reports regression estimates for the sample of sued firms that did not obtain a patent in the three years before the filing and the corresponding matched firms. Robust standard errors clustered at the firm level are reported in parentheses. Variables definitions can be found in Table 4.1. *, **, *** Statistically different from zero at the 10, 5 and 1 percent significance levels, respectively.

	Dependent Variable: Citations (Fixed)		
	All	Patent Pre-Filing	No-Patent Pre-Filing
Immediate	-0.030***	-0.033***	-0.024**
	(0.01)	(0.01)	(0.01)
Post	-0.041***	-0.032**	-0.050***
	(0.01)	(0.02)	(0.02)
Sued	0.028**	0.149***	-0.214***
	(0.01)	(0.02)	(0.02)
Immediate * Sued	0.007	-0.013	0.074***
	(0.02)	(0.02)	(0.03)
Post * Sued	0.028	-0.043	0.137***
	(0.02)	(0.03)	(0.04)
Size	0.072***	0.069***	0.056***
	(0.00)	(0.00)	(0.00)
Leverage	-0.026*	-0.049**	-0.003
	(0.02)	(0.02)	(0.02)
ROA	0.031***	0.023	0.022*
	(0.01)	(0.01)	(0.01)
Return	-0.004	-0.001	-0.004
	(0.00)	(0.00)	(0.00)
B/M	0.001***	0.000***	0.001**
	(0.00)	(0.00)	(0.00)
Tangibles	0.021*	0.047***	-0.007
	(0.01)	(0.02)	(0.02)
R&D	0.255***	0.229***	0.186***
	(0.02)	(0.03)	(0.03)
Dividends	-0.152*	-0.360***	-0.023
	(0.09)	(0.12)	(0.11)
H-Index	0.498***	0.300***	0.312***
	(0.07)	(0.11)	(0.09)
H-Index^2	-0.380***	-0.148	-0.231**
	(0.08)	(0.13)	(0.09)
High-Tech	0.240***	0.163***	0.220***
	(0.01)	(0.02)	(0.01)
Intercept	-0.491***	-0.404***	-0.342***
	(0.03)	(0.04)	(0.03)
Firm Fixed Effect	Yes	Yes	Yes
Year Fixed Effect	Yes	Yes	Yes
R^2	0.14	0.12	0.14
N	21,530	12,583	8,947

Table 4.13: Impact of the Filing of a Class Action on the Number of Citations (Quasi) – Settled Cases

Table 4.13 reports OLS regression estimates for the effect the filing of a class action that was settled has on the number of citations. The dependent variable in this regression is the log of one plus the number of citations per patent multiplied by an adjustment factor obtained from the citation lag distribution. The regressions were estimated for a sample of sued and propensity score matching sample of non-sued firms. The number of citations were analysed for a window of up to five years before and after the filing of a SCA. The first column (*All*) presents results obtained for regressions estimated on all sued and matched firms. The second column (*Patent Pre-Filing*) reports regression estimates for the sample of sued firms that obtained at least one patent in the three years before the filing and the corresponding matched firm. The second column (*No-Patent Pre-Filing*) reports regression estimates for the sample of sued firms that did not obtain a patent in the three years before the filing and the corresponding matched firms. Robust standard errors clustered at the firm level are reported in parentheses. Variables definitions can be found in Table 4.1. *, **, *** Statistically different from zero at the 10, 5 and 1 percent significance levels, respectively.

	Dependent Variable: Citations (Quasi)		
	All	Patent Pre-Filing	No-Patent Pre-Filing
Immediate	-0.088***	-0.068*	-0.109***
	(0.03)	(0.04)	(0.04)
Post	-0.112***	-0.047	-0.191***
	(0.04)	(0.05)	(0.05)
Sued	0.146***	0.623***	-0.817***
	(0.04)	(0.05)	(0.06)
Immediate * Sued	-0.027	-0.148*	0.310***
	(0.06)	(0.08)	(0.08)
Post * Sued	0.053	-0.256**	0.550***
	(0.08)	(0.10)	(0.12)
Size	0.277***	0.272***	0.198***
	(0.01)	(0.01)	(0.01)
Leverage	-0.106**	-0.154**	-0.067
	(0.05)	(0.06)	(0.07)
ROA	0.137***	0.124***	0.089**
	(0.03)	(0.05)	(0.04)
Return	-0.022***	-0.013	-0.024*
	(0.01)	(0.01)	(0.01)
B/M	0.003***	0.002***	0.006***
	(0.00)	(0.00)	(0.00)
Tangibles	0.254***	0.416***	0.068
	(0.04)	(0.06)	(0.05)
R&D	0.836***	0.710***	0.610***
	(0.08)	(0.10)	(0.10)
Dividends	-0.063	-0.759*	0.239
	(0.27)	(0.39)	(0.35)
H-Index	2.750***	2.175***	1.629***
	(0.23)	(0.35)	(0.29)
H-Index^2	-2.250***	-1.521***	-1.299***
	(0.25)	(0.39)	(0.31)
High-Tech	0.973***	0.701***	0.822***
	(0.03)	(0.05)	(0.04)
Intercept	-2.219***	-2.024***	-1.356***
	(0.08)	(0.11)	(0.11)
Firm Fixed Effect	Yes	Yes	Yes
Year Fixed Effect	Yes	Yes	Yes
R^2	0.20	0.21	0.17
N	21,530	12,583	8,947

Table 4.14: Impact of the Filing of a Class Action on the Value Added by Patents – Settled Cases

Table 4.14 reports OLS regression estimates for the effect the filing of a class action that was settled has on the value added by patents. The dependent variable in this regression is the log of one plus the average value added per patent. The regressions were estimated for a sample of sued and propensity score matching sample of non-sued firms. The value added was analysed for a window of up to five years before and after the filing of a SCA. The first column (*All*) presents results obtained for regressions estimated on all sued and matched firms. The second column (*Patent Pre-Filing*) reports regression estimates for the sample of sued firms that obtained at least one patent in the three years before the filing and the corresponding matched firm. The second column (*No-Patent Pre-Filing*) reports regression estimates for the sample of sued firms that did not obtain a patent in the three years before the filing and the corresponding matched firms. Robust standard errors clustered at the firm level are reported in parentheses. Variables definitions can be found in Table 4.1. *, **, *** Statistically different from zero at the 10, 5 and 1 percent significance levels, respectively.

	Dependent Variable: Value Added		
	All	Patent Pre-Filing	No-Patent Pre-Filing
Immediate	-0.041**	-0.050**	-0.005
	(0.02)	(0.02)	(0.03)
Post	-0.092***	-0.103***	-0.042
	(0.03)	(0.03)	(0.05)
Sued	0.060**	0.047	0.306
	(0.03)	(0.03)	(0.21)
Immediate * Sued	-0.032	-0.002	-0.220
	(0.04)	(0.05)	(0.24)
Post * Sued	0.035	0.102	-0.485*
	(0.06)	(0.07)	(0.28)
Size	0.488***	0.476***	0.512***
	(0.00)	(0.00)	(0.01)
Leverage	0.275***	0.288***	0.243***
	(0.04)	(0.05)	(0.07)
ROA	0.000	0.099***	-0.154***
	(0.03)	(0.04)	(0.04)
Return	-0.012**	-0.016**	0.003
	(0.01)	(0.01)	(0.01)
B/M	0.001***	0.001***	-0.001
	(0.00)	(0.00)	(0.00)
Tangibles	-0.033	-0.174***	0.268***
	(0.03)	(0.04)	(0.05)
R&D	0.364***	0.541***	-0.020
	(0.06)	(0.07)	(0.11)
Dividends	-0.351	0.100	-0.788**
	(0.22)	(0.29)	(0.31)
H-Index	-1.158***	-1.214***	-1.076***
	(0.19)	(0.23)	(0.32)
H-Index^2	1.200***	1.290***	0.981***
	(0.20)	(0.26)	(0.33)
High-Tech	0.060**	0.040	0.111**
	(0.03)	(0.03)	(0.05)
Intercept	-1.863***	-1.762***	-2.096***
	(0.07)	(0.08)	(0.13)
Firm Fixed Effect	Yes	Yes	Yes
Year Fixed Effect	Yes	Yes	Yes
R^2	0.65	0.64	0.67
N	10,131	7,607	2,524

Table 4.15: Impact of the Filing of a Class Action on Innovative Efficiency (Patents) – Settled Cases

Table 4.15 reports OLS regression estimates for the effect the filing of a class action that was settled has on innovative efficiency of patenting. The dependent variable in this regression is the log of one plus *IE Patents*. The regressions were estimated for a sample of sued and propensity score matching sample of non-sued firms. Innovative efficiency was analysed for a window of up to five years before and after the filing of a SCA. The first column (*All*) presents results obtained for regressions estimated on all sued and matched firms. The second column (*Patent Pre-Filing*) reports regression estimates for the sample of sued firms that obtained at least one patent in the three years before the filing and the corresponding matched firm. The second column (*No-Patent Pre-Filing*) reports regression estimates for the sample of sued firms that did not obtain a patent in the three years before the filing and the corresponding matched firms. Robust standard errors clustered at the firm level are reported in parentheses. Variables definitions can be found in Table 4.1. *, **, *** Statistically different from zero at the 10, 5 and 1 percent significance levels, respectively.

	Dependent Variable: IE Patents		
	All	Patent Pre-Filing	No-Patent Pre-Filing
Immediate	-0.011*	-0.018**	0.000
	(0.01)	(0.01)	(0.01)
Post	-0.012	-0.013	-0.018
	(0.01)	(0.01)	(0.02)
Sued	0.012	0.010	0.065
	(0.01)	(0.01)	(0.08)
Immediate * Sued	0.012	0.015	-0.093
	(0.01)	(0.01)	(0.09)
Post * Sued	0.021	0.010	-0.009
	(0.02)	(0.02)	(0.11)
Size	-0.031***	-0.027***	-0.039***
	(0.00)	(0.00)	(0.00)
Leverage	0.008	-0.020	0.080***
	(0.01)	(0.01)	(0.03)
ROA	0.049***	0.040***	0.059***
	(0.01)	(0.01)	(0.02)
Return	0.009***	0.009***	0.011**
	(0.00)	(0.00)	(0.01)
B/M	0.000***	0.000***	-0.001
	(0.00)	(0.00)	(0.00)
Tangibles	0.055***	0.101***	-0.041**
	(0.01)	(0.01)	(0.02)
Dividends	0.723***	0.311***	1.227***
	(0.07)	(0.09)	(0.12)
H-Index	0.387***	0.397***	0.218*
	(0.06)	(0.07)	(0.13)
H-Index^2	-0.290***	-0.212***	-0.260**
	(0.07)	(0.08)	(0.13)
High-Tech	-0.008	0.024**	-0.109***
	(0.01)	(0.01)	(0.02)
Intercept	0.244***	0.198***	0.392***
	(0.02)	(0.03)	(0.05)
Firm Fixed Effect	Yes	Yes	Yes
Year Fixed Effect	Yes	Yes	Yes
R^2	0.11	0.10	0.17
N	10,186	7,658	2,528

Table 4.16: Impact of the Filing of a Class Action on Innovative Efficiency (Citations (Fixed)) – Settled Cases

Table 4.16 reports OLS regression estimates for the effect the filing of a class action that was settled has on innovative efficiency of the citations received on patents. The dependent variable in this regression is the log of one plus *IE Citations (Fixed)*. The regressions were estimated for a sample of sued and propensity score matching sample of non-sued firms. Innovative efficiency was analysed for a window of up to five years before and after the filing of a SCA. The first column (*All*) presents results obtained for regressions estimated on all sued and matched firms. The second column (*Patent Pre-Filing*) reports regression estimates for the sample of sued firms that obtained at least one patent in the three years before the filing and the corresponding matched firm. The second column (*No-Patent Pre-Filing*) reports regression estimates for the sample of sued firms that did not obtain a patent in the three years before the filing and the corresponding matched firms. Robust standard errors clustered at the firm level are reported in parentheses. Variables definitions can be found in Table 4.1. *, **, *** Statistically different from zero at the 10, 5 and 1 percent significance levels, respectively.

	Dependent Variable: IE Citations (Fixed)		
	All	Patent Pre-Filing	No-Patent Pre-Filing
Immediate	-0.026***	-0.042***	0.003
	(0.01)	(0.01)	(0.02)
Post	-0.027**	-0.039**	-0.007
	(0.01)	(0.02)	(0.02)
Sued	0.049***	0.048***	0.022
	(0.01)	(0.01)	(0.06)
Immediate * Sued	0.010	0.016	-0.164*
	(0.02)	(0.02)	(0.10)
Post * Sued	-0.008	-0.002	-0.147
	(0.03)	(0.03)	(0.10)
Size	-0.029***	-0.025***	-0.039***
	(0.00)	(0.00)	(0.00)
Leverage	-0.055***	-0.098***	0.056
	(0.02)	(0.02)	(0.04)
ROA	0.036***	0.030**	0.047***
	(0.01)	(0.01)	(0.02)
Return	0.020***	0.019***	0.023***
	(0.00)	(0.00)	(0.01)
B/M	0.000**	0.000**	-0.002**
	(0.00)	(0.00)	(0.00)
Tangibles	0.073***	0.124***	-0.027
	(0.01)	(0.02)	(0.03)
Dividends	0.041	-0.424***	0.462**
	(0.12)	(0.15)	(0.18)
H-Index	0.291***	0.456***	-0.209
	(0.09)	(0.11)	(0.17)
H-Index^2	-0.175*	-0.275**	0.207
	(0.10)	(0.12)	(0.17)
High-Tech	-0.007	0.044***	-0.146***
	(0.01)	(0.02)	(0.03)
Intercept	0.375***	0.324***	0.529***
	(0.03)	(0.04)	(0.06)
Firm Fixed Effect	Yes	Yes	Yes
Year Fixed Effect	Yes	Yes	Yes
R^2	0.05	0.05	0.09
N	13,189	9,602	3,587

Table 4.17: Impact of the Filing of a Class Action on Innovative Efficiency (Citations (Quasi)) – Settled Cases

Table 4.17 reports OLS egression estimates for the effect the filing of a class action that was settled has on innovative efficiency of the citations received on patents. The dependent variable in this regression is the log of one plus *IE Citations (Quasi)*. The regressions were estimated for a sample of sued and propensity score matching sample of non-sued firms. Innovative efficiency was analysed for a window of up to five years before and after the filing of a SCA. The first column (*All*) presents results obtained for regressions estimated on all sued and matched firms. The second column (*Patent Pre-Filing*) reports regression estimates for the sample of sued firms that obtained at least one patent in the three years before the filing and the corresponding matched firm. The second column (*No-Patent Pre-Filing*) reports regression estimates for the sample of sued firms that did not obtain a patent in the three years before the filing and the corresponding matched firms. Robust standard errors clustered at the firm level are reported in parentheses. Variables definitions can be found in Table 4.1. *, **, *** Statistically different from zero at the 10, 5 and 1 percent significance levels, respectively.

	Dependent Variable: IE Citations (Quasi)		
	All	Patent Pre-Filing	No-Patent Pre-Filing
Immediate	-0.043	-0.072**	-0.009
	(0.03)	(0.03)	(0.05)
Post	-0.036	-0.045	-0.060
	(0.04)	(0.04)	(0.07)
Sued	0.164***	0.176***	-0.167
	(0.04)	(0.04)	(0.16)
Immediate * Sued	0.036	0.052	-0.503*
	(0.06)	(0.06)	(0.27)
Post * Sued	-0.025	-0.010	-0.292
	(0.08)	(0.09)	(0.26)
Size	-0.064***	-0.049***	-0.108***
	(0.01)	(0.01)	(0.01)
Leverage	-0.365***	-0.475***	-0.079
	(0.05)	(0.06)	(0.10)
ROA	0.139***	0.117***	0.192***
	(0.03)	(0.03)	(0.05)
Return	0.061***	0.055***	0.082***
	(0.01)	(0.01)	(0.02)
B/M	0.000	0.000	-0.005**
	(0.00)	(0.00)	(0.00)
Tangibles	0.294***	0.470***	-0.042
	(0.04)	(0.05)	(0.07)
Dividends	-0.579*	-1.810***	0.497
	(0.32)	(0.43)	(0.49)
H-Index	1.596***	2.352***	-0.505
	(0.26)	(0.31)	(0.46)
H-Index^2	-1.330***	-1.935***	0.467
	(0.28)	(0.35)	(0.48)
High-Tech	0.139***	0.285***	-0.273***
	(0.04)	(0.04)	(0.07)
Intercept	1.098***	0.855***	1.847***
	(0.09)	(0.11)	(0.17)
Firm Fixed Effect	Yes	Yes	Yes
Year Fixed Effect	Yes	Yes	Yes
R^2	0.12	0.12	0.15
N	13,189	9,602	3,587

Chapter 5

Conclusion

5.1 Summary of Main Findings

This thesis investigates the determinants and consequences of securities class actions (SCAs) from three different perspectives. First, Chapter 2 investigates whether the *reputation* of a lender or lending *relationships* are associated with the occurrence of SCAs. In the second empirical study (Chapter 3) the relationship between political lobbying and SCAs is examined. Finally, Chapter 4 analyses the association between a firm's innovative activities and the incidence of shareholder litigation.

The main findings from Chapter 2 indicate that firms are less likely to have a SCA filed against them if they borrow from a *reputable* lender. This finding appears to be a result of reputable lenders screening out prospective borrowers with a high risk of litigation. Chapter 2 also presents evidence that, after being sued, firms are less likely to be able to develop a *relationship* with a lender if they did not already have one. Further, if a firm did not have a prior relationship with a lender, loans obtained after the filing of a SCA generally have larger spreads and are shorter in maturity. However, if a firm had a relationship with a lender they are more likely to continue that relationship after being sued. Sued firms with an *ex-ante* lending relationship receive more favourable terms on loans obtained after the filing relative to sued firms without a relationship. These benefits include relatively smaller spreads and better access to more capital. Overall, these findings suggest that lenders may be willing to provide more lenient terms, even after the firm faces

allegations of misconduct, in order to maintain a relationship with the borrowing firm. Consequently, the evidence suggests that reputational penalties imposed on loans after the filing of a SCA can mostly be negated by the existence of a lending relationship.

The analysis conducted in Chapter 2 makes several contributions to the literature on the determinants and consequences of SCAs, as well as the literature on private debt financing. First, this is the first empirical work that examines whether *reputable* lenders are more adept at avoiding or limiting the incidence of shareholder litigation. Second, this is the first empirical work to examine how a firm's *relationship* with its lenders is impacted by the filing of a SCA. Finally, this paper extends the current understanding of reputational penalties imposed on new loans by explicitly accounting for firms' *ex-ante* lending relationships.

Chapter 3 investigates whether lobbying activities are associated with the occurrence of corporate misconduct. The main findings of this chapter indicate that lobbying firms exhibited longer class periods and were marginally less likely to settle a SCA prior to 2004. These findings suggest economic agents may have been unwilling to come forward with evidence of misconduct against lobbying firms, for fear of the repercussions. However, from 2005 onwards, lobbying is not related to the length of the class period or the likelihood of settlement. These findings are consistent with the enactment of SOX improving the incentives for economic agents to reveal evidence of corporate misconduct.

The findings of Chapter 3 contribute to the understanding of factors that influence the detection and outcome of SCAs. Specifically, it extends the analysis undertaken by Yu and Yu (2011) and shows that although lobbying firms appear to be able to get away with their misconduct for longer prior to 2004, they are not able to do so afterward. Furthermore, Chapter 3 also contributes to the understanding of the drivers of the direct costs of SCAs by examining the impact political connections have on the probability and size of the settlement. Finally, this study also provides insight into the effect that SOX may have had on the detection of corporate misconduct.

In the final empirical study (Chapter 4), the association between corporate innovation and SCAs is examined. The primary findings of this chapter indicate that firms are more likely to be sued if they invest in innovation, which is consistent with innovative firms having higher information asymmetry thereby providing them with more opportunities to commit misconduct. Furthermore, among innovating firms, the level of innovative success is inversely associated with the probability of being sued. This finding is consistent with

less innovatively successful firms facing greater pressures to commit misconduct. Finally, after the filing of a SCA investment in innovation immediately declines. This appears to result in a decline in the number of patents obtained. However, the filing of a SCA does not appear to substantially impact the quality of patents being produced or the innovative efficiency of firms.

The results presented in Chapter 4 contribute to the understanding of the determinants and consequences of SCAs. This chapter is the first empirical study to investigate whether corporate innovation is associated with the occurrence of shareholder litigation. This is also the first empirical work to examine the impact that the filing of a SCA has on a firm's innovative activities.

5.2 Practical Implications and Future Research

The results reported in the three empirical studies contribute to the literature on the determinants and consequences of shareholder litigation, but also have a number of practical implications. The findings from Chapter 2 suggest that firms are more likely to be sued if they do not borrow from a reputable lender. Similarly, the results of Chapter 4 indicate that litigation risk is higher for innovative firms. Furthermore, firms that do not innovate successfully relative to their competitors are also more likely to face shareholder litigation. These two chapters, therefore, provide a better understanding of characteristics that are associated with the occurrence of shareholder litigation. As such, particularly risk averse market participants that want to limit their exposure to the risk of litigation may want to potentially avoid dealing with firms with high levels of innovation and firms that do not borrow from reputable lenders.

The results reported in Chapter 2 suggest that reputable lenders are able to avoid lending to high litigation risk firms. However, there is no evidence to suggest that reputable lenders enhanced incentives to monitor borrowers, impacts the occurrence of misconduct. These results suggest that it is possible for lenders to avoid firms that end up being sued but they are not able to limit the incidence of shareholder litigation. This would indicate that lenders wanting to avoid the potential negative reputational consequences of lending to a firm that is sued should focus on screening rather than monitoring in their lending policies.

An understanding of the determinants of shareholder litigation can also be very useful for detecting and preventing the future violation of securities laws. Although not all class actions are meritorious in nature, the findings reported in Chapter 2 and Chapter 4 can be useful for identifying firms where misconduct is more likely to occur. The analysis conducted in Chapters 2 and 4 suggest that simple indicators for whether firms are innovating or whether they are borrowing from a less reputable lender could be helpful in identifying firms that are more likely to commit misconduct. As such, the findings should be a useful aide to help market participants and public enforcement agencies (such as the Securities Exchange Commission (SEC)) be more effective at detecting the violation of securities laws. Furthermore, the findings reported in Chapter 4 suggest that the innovative success of a firm relative to its competitors could be useful in identifying and detecting the incidence of malfeasance.

The analysis on the probability of being sued that was conducted in Chapter 4 could also be used to develop appropriate legislation to limit the occurrence of misconduct. In Chapter 4, it is argued that innovative firms may have more opportunities and face greater pressures to commit misconduct, which is supported by the results. It may be possible to limit the incidence of managerial malfeasance by developing appropriate legislation that limits the opportunities and alleviates the pressures that innovating firms face. This legislation could come in the form of more informative disclosures about innovative projects and the likelihood of them coming to fruition. To be effective such legislation would need to ensure that these disclosures do not unduly undercut the competitive advantage of innovating firms.

An alternative way to limit the occurrence of misconduct would be to improve the incentives for various economic agents to come forward with evidence of any illegal activities. Chapter 3 presents evidence that the class period is significantly longer for lobbying firms before the enactment of SOX. However, following the implementation of SOX this longer class period no longer holds. It is argued that SOX has improved the incentives for various economic agents to come forward with evidence of misconduct, thereby improving the detection of malfeasance. These findings support the notion that appropriate legislation can be a useful way to improve the detection of corporate misconduct.

The empirical analyses also investigate the consequences of SCAs, which are useful for determining the efficacy of SCAs as an *ex-post* method of disciplining managers. The

results reported in Chapter 2 suggest that shareholder litigation does not undermine a firm's relationship with its providers of financial capital. Firms that had an existing relationship with a lender are more likely to continue that relationship and receive more favourable terms on new loans after being sued (relative to firms without a relationship). These more favourable terms effectively offset any reputational consequences caused by the allegation of misconduct. The results suggest that the damage associated with the filing of a SCA is likely to be minimal provided that the firm had a relationship with its lender. Since the reputational damage can largely be negated by the existence of a lending relationship, SCAs appear to serve a very limited role as an *ex-post* method of disciplining managers. The findings reported in Chapter 2 also suggest that SCAs play a relatively limited role in deterring managers from violating securities laws due to the minimal nature of the penalties they face if the firm had a lending relationship.

The consequences of the filing of a SCA on a firm's innovative activities are also examined in Chapter 4. The results suggest that R&D expenditures immediately decline after being sued, which appears to result in a decline in the number of patents being produced. However, the quality of patents and the overall innovative efficiency are unaffected. These findings indicate that SCAs may have an impact on innovative activities but there is no evidence to suggest that this change is beneficial to the firm. Based on these results, SCAs do not appear to discipline managers or improve the efficiency of investment in innovation.

Overall, this thesis reports little evidence to suggest that SCAs are an effective mechanism for disciplining a firm's managers. Consequently, the results do not support the notion that SCAs serve as a deterrence mechanism. Although this thesis furthers the current understanding of the determinants and consequences of SCAs, there is still further avenues of research that could be explored to gain a greater understanding of the importance of shareholder litigation in corporate governance.

Future research could extend the study conducted in Chapter 2 by exploring whether reputational penalties imposed by other stakeholders (such as customers or suppliers) after the filing of a SCA are impacted by a relationship between the sued firm and the stakeholder. Future research could also investigate in more detail whether the observed changes in innovative activity after the filing of a SCA, as reported in Chapter 4, are beneficial to the firm. The focus of this thesis and the majority of the literature so far has been on shareholder litigation in the US. There has been very limited research

investigating the determinants and consequences of SCAs in non-US countries. As such, there are numerous research opportunities to investigate how differences in legal, regulatory, political and corporate structures impact the occurrence and outcomes of shareholder litigation. This research will help provide further insight into the efficacy of SCAs as an *ex-post* disciplinary mechanism not just in the US but globally as well.

References

Aboody, D. & Lev, B. 2000. Information asymmetry, R&D, and insider gains. *Journal of Finance,* 55, 2747-2766.

Acharya, V. V., Baghai, R. P. & Subramanian, K. V. 2014. Wrongful discharge laws and innovation. *Review of Financial Studies,* 27, 301-346.

Aghion, P., Bloom, N., Blundell, R., Griffith, R. & Howitt, P. 2005. Competition and innovation: An inverted-U relationship. *The Quarterly Journal of Economics,* 120, 701-728.

Ai, C., & Norton, E. C. 2003. Interaction terms in logit and probit models. *Economics Letters,* 80, 123-129.

Arena, M. & Ferris, S. P. 2017. A survey of litigation in corporate finance. *Managerial Finance,* 43, 4-18.

Arena, M. & Julio, B. 2015. The effects of securities class action litigation on corporate liquidity and investment policy. *Journal of Financial and Quantitative Analysis,* 50, 251-275.

Atanassov, J. 2013. Do hostile takeovers stifle innovation? Evidence from antitakeover legislation and corporate patenting. *Journal of Finance,* 68, 1097-1131.

Autore, D. M., Hutton, I., Peterson, D. R. & Smith, A. H. 2014. The effect of securities litigation on external financing. *Journal of Corporate Finance,* 27, 231-250.

Balakrishnan, K. & Darendeli, A. 2017. Localized competition and firm performance. Working Paper, London Business School.

Banerjee, S., Humphery-Jenner, M., Nanda, V. K. & Tham, T. M. 2017. Executive overconfidence and securities class actions. *Journal of Financial and Quantitative Analysis,* Forthcoming.

Barringer, F. 2002. Enron's many Strands: Early scrutiny; 10 months ago, questions on Enron came and went with little notice. *The New York Times*, 21 January, Available from: http://www.nytimes.com/2002/01/28/us/enron-s-many-strands-early-scrutiny-10-months-ago-questions-enron-came-went-with.html

Bauer, R. & Braun, R. 2010. Misdeeds matter: Long-term stock price performance after the filing of class-action lawsuits. *Financial Analysts Journal,* 66, 74-92.

Bauer, R., Braun, R. & Moers, F. 2008. Sued or glued: How to compensate the CEO. Working Paper, University of Maastricht.

Baumgartner, S. P. 2009. The globalization of class actions: Switzerland. *Annals of the American Academy of Political and Social Science,* 622, 179-187.

Becht, M., Bolton, P. & Röell, A. 2003. Corporate governance and control. *Handbook of the Economics of Finance,* 1, 1-109.

Berger, A. N. & Udell, G. F. 1995. Relationship lending and lines of credit in small firm finance. *The Journal of Business,* 68, 351-381.

Bhagat, S., Brickley, J. A. & Coles, J. L. 1994. The costs of inefficient bargaining and financial distress: Evidence from corporate lawsuits. *Journal of Financial Economics,* 35, 221-247.

Bharath, S. T., Dahiya, S., Saunders, A. & Srinivasan, A. 2011. Lending relationships and loan contract terms. *Review of Financial Studies,* 24, 1141-1203.

Bhattacharya, S. & Ritter, J. R. 1983. Innovation and communication: Signalling with partial disclosure. *The Review of Economic Studies,* 50, 331-346.

Billett, M. T., Flannery, M. J. & Garfinkel, J. A. 1995. The effect of lender identity on a borrowing firm's equity return. *Journal of Finance,* 50, 699-718.

Blau, B. M., Brough, T. J. & Thomas, D. W. 2013. Corporate lobbying, political connections, and the bailout of banks. *Journal of Banking & Finance,* 37, 3007-3017.

Bolton, P., Freixas, X., Gambacorta, L. & Mistrulli, P. E. 2016. Relationship and transaction lending in a crisis. *Review of Financial Studies,* 29, 2643-2676.

Boot, A. W. A. & Thakor, A. V. 1994. Moral hazard and secured lending in an infinitely repeated credit market game. *International Economic Review,* 35, 899-920.

Boot, A. W. A. & Thakor, A. V. 2000. Can relationship banking survive competition? *Journal of Finance,* 55, 679-713.

Boot, A. W. A. 2000. Relationship banking: What do we know? *Journal of Financial Intermediation,* 9, 7-25.

Booth, J. R. & Smith, R. L. 1986. Capital raising, underwriting and the certification hypothesis. *Journal of Financial Economics,* 15, 261-281.

Bosch, O. & Steffen, S. 2011. On syndicate composition, corporate structure and the certification effect of credit ratings. *Journal of Banking & Finance,* 35, 290-299.

Bushman, R. M. & Wittenberg-Moerman, R. 2012. The role of bank reputation in "certifying" future performance implications of borrowers' accounting numbers. *Journal of Accounting Research,* 50, 883-930.

Chava, S. & Roberts, M. R. 2008. How does financing impact investment? The role of debt covenants. *Journal of Finance,* 63, 2085-2121.

Chava, S., Cheng, C. S. A., Huang, H. & Lobo, G. J. 2010. Implications of securities class actions for cost of equity capital. *International Journal of Law and Management,* 52, 144-161.

Chemmanur, T. J. & Fulghieri, P. 1994a. Investment bank reputation, information production, and financial intermediation. *Journal of Finance,* 49, 57-79.

Chemmanur, T. J. & Fulghieri, P. 1994b. Reputation, renegotiation, and the choice between bank loans and publicly traded debt. *Review of Financial Studies,* 7, 475-506.

Chemmanur, T. J. & Tian, X. 2017. Do antitakeover provisions spur corporate innovation? A regression discontinuity analysis. . *Journal of Financial and Quantitative Analysis,* Forthcoming.

Chemmanur, T. J., Loutskina, E. & Tian, X. 2014. Corporate venture capital, value creation, and innovation. *Review of Financial Studies,* 27, 2434-2473.

Chen, H., Parsley, D. & Yang, Y. W. 2015. Corporate lobbying and firm performance. *Journal of Business Finance & Accounting,* 42, 444-481.

Cheng, C. S. A., He Huang, H., Li, Y. & Lobo, G. 2010. Institutional monitoring through shareholder litigation. *Journal of Financial Economics,* 95, 356-383.

Choi, S. J. 2004. The evidence on securities class actions. Working Paper, New York University.

Choi, S. J., Nelson, K. K. & Pritchard, A. C. 2009. The screening effect of the private securities litigation reform act. *Journal of Empirical Legal Studies,* 6, 35-68.

Chy, M. & Hope, O. K. 2016. Does high auditor litigation risk discourage corporate innovation? Working Paper, University of Toronto.

Coffee, J. C. 2006. Reforming the securities class action: An essay on deterrence and its implementation. *Columbia Law Review,* 106, 1534-1586.

Cole, R. A. 1998. The importance of relationships to the availability of credit. *Journal of Banking & Finance,* 22, 959-977.

Cornerstone Research. 2017a. Securities class action filing: 2016 year in review.

Cornerstone Research. 2017b. Securities class action settlements: 2016 review and analysis.

Correia, M. M. 2014. Political connections and SEC enforcement. *Journal of Accounting and Economics,* 57, 241-262.

Cotugno, M., Monferrà, S. & Sampagnaro, G. 2013. Relationship lending, hierarchical distance and credit tightening: Evidence from the financial crisis. *Journal of Banking & Finance,* 37, 1372-1385.

Cox, J. D. & Thomas, R. S. 2006. Does the plaintiff matter? An empirical analysis of lead plaintiffs in securities class actions. *Columbia Law Review,* 106, 1587-1640.

Cox, J. D., Thomas, R. S. & Kiku, D. 2004. Public and private enforcement of the securities laws: Have things changed since Enron. *Notre Dame Law Review,* 80, 893-907.

Cressey, D. R. 1953. *Other people's money; a study of the social psychology of embezzlement*, US: Free Press.

Dahiya, S., Saunders, A. & Srinivasan, A. 2003. Financial distress and bank lending relationships. *Journal of Finance,* 58, 375-399.

Dam, K. W. 1975. Class actions: Efficiency, compensation, deterrence, and conflict of interest. *The Journal of Legal Studies,* 4, 47-73.

Deng, S., Willis, R. H. & Xu, L. 2014. Shareholder litigation, reputational loss, and bank loan contracting. *Journal of Financial and Quantitative Analysis,* 49, 1101-1132.

Denis, D. J., & Mihov, V. T.. 2003. The choice among bank debt, non-bank private debt, and public debt: Evidence from new corporate borrowings. *Journal of Financial Economics,* 70, 3-28.

Diamond, D. W. 1991. Monitoring and reputation: The choice between bank loans and directly placed debt. *Journal of Political Economy,* 99, 689-721.

Djankov, S., La Porta, R., Lopez-De-Silanes, F. & Shleifer, A. 2008. The law and economics of self-dealing. *Journal of Financial Economics,* 88, 430-465.

Drutman, L. 2015. *The business of America is lobbying: How corporations became politicized and politics became more corporate*, Oxford University Press.

Duchin, R. & Sosyura, D. 2012. The politics of government investment. *Journal of*

Financial Economics, 106, 24-48.

Dyck, A., Morse, A. & Zingales, L. 2010. Who blows the whistle on corporate fraud? *Journal of Finance,* 65, 2213-2253.

Easterbrook, F. H., & Fischel, D. R. 1984. Mandatory disclosure and the protection of investors. *Virginia Law Review,* 70, 669-715.

Elsas, R. & Krahnen, J. P. 1998. Is relationship lending special? Evidence from credit-file data in Germany. *Journal of Banking & Finance,* 22, 1283-1316.

Elyasiani, E. & Goldberg, L. G. 2004. Relationship lending: A survey of the literature. *Journal of Economics and Business,* 56, 315-330.

Fama, E. F. & French, K. R. 1997. Industry costs of equity. *Journal of Financial Economics,* 43, 153-193.

Fang, L. H. 2005. Investment bank reputation and the price and quality of underwriting services. *Journal of Finance,* 60, 2729-2761.

Fang, V. W., Tian, X. & Tice, S. 2014. Does stock liquidity enhance or impede firm innovation? *Journal of Finance,* 69, 2085-2125.

Ferris, S. P., Jandik, T., Lawless, R. M. & Makhija, A. 2007. Derivative lawsuits as a corporate governance mechanism: Empirical evidence on board changes surrounding filings. *Journal of Financial and Quantitative Analysis,* 42, 143-165.

Finnerty, J. D., Hegde, S. & Malone, C. B. 2016. Fraud and firm performance: Keeping the good times (apparently) rolling. *Managerial Finance,* 42, 151-172.

Fulmer, S., Knill, A. M. & Yu, X. 2012. Negation of Sanctions: The Personal Effect of Political Contributions. Working Paper, University of Tampa.

Gande, A. & Lewis, C. M. 2009. Shareholder-initiated class action lawsuits: Shareholder wealth effects and industry spillovers. *Journal of Financial and Quantitative Analysis,* 44, 823-850.

Gehrig, T. & Stenbacka, R. 2007. Information sharing and lending market competition with switching costs and poaching. *European Economic Review,* 51, 77-99.

Gillan, S. L. 2006. Recent developments in corporate governance: An overview. *Journal of Corporate Finance,* 12, 381-402.

Goldman, E., Rocholl, J. & So, J. 2013. Politically connected boards of directors and the allocation of procurement contracts. *Review of Finance,* 17, 1617-1648.

Gopalan, R., Nanda, V. & Yerramilli, V. 2011b. Does poor performance damage the reputation of financial intermediaries? Evidence from the loan syndication market.

Journal of Finance, 66, 2083-2120.

Gopalan, R., Udell, G. F. & Yerramilli, V. 2011a. Why do firms form new banking relationships? *Journal of Financial & Quantitative Analysis*, 46, 1335-1365.

Graham, J. R., Li, S. & Qiu, J. 2008. Corporate misreporting and bank loan contracting. *Journal of Financial Economics,* 89, 44-61.

Greenbaum, S. I., Kanatas, G. & Venezia, I. 1989. Equilibrium loan pricing under the bank-client relationship. *Journal of Banking & Finance*, 13, 221-235.

Griffin, P. A. & Lont, D. H. 2007. An analysis of the audit fees following the passage of Sarbanes-Oxley. *Asia Pacific Journal of Accounting and Economics,* 14, 161-192.

Griffin, P. A., Grundfest, J. A. & Perino, M. A. 2004. Stock price response to news of securities fraud litigation: An analysis of sequential and conditional information. *Abacus*, 40, 21-48.

Griliches, Z., Pakes, A. & Hall, B. H. 1986. The value of patents as indicators of inventive activity. NBER Working Paper No. 2083.

Gu, F. 2005. Innovation, future earnings, and market efficiency. *Journal of Accounting, Auditing & Finance,* 20, 385-418.

Gu, Y., Mao, C. X. & Tian, X. 2014. Bank interventions and firm innovation: Evidence from debt covenant violations. Working Paper, Western New England University.

Hale, G. & Santos, J. A. C. 2009. Do banks price their informational monopoly? *Journal of Financial Economics*, 93, 185-206.

Hall, B. H., Jaffe, A. B. & Trajtenberg, M. 2001. The NBER patent citation data file: Lessons, insights and methodological tools. NBER Working Paper No. 8498.

Hall, B. H., Jaffe, A. B. & Trajtenberg, M. 2005. Market value and patent citations. *The RAND Journal of Economics,* 36, 16-38.

He, J. & Tian, X. 2013. The dark side of analyst coverage: The case of innovation. *Journal of Financial Economics*, 109, 856-878.

Hensler, D. R. 2016. Can private class actions enforce regulations? Do they? Should they? In: F. Bignami & D. Zaring, eds. *Comparative Law and Regulation: Understanding the Global Regulatory Process*, Edward Elgar, 238-272.

Hill, M. D., Kelly, G. W., Lockhart, G. B. & Van Ness, R. A. 2013. Determinants and effects of corporate lobbying. *Financial Management,* 42, 931-957.

Hirshleifer, D., Hsu, P. H. & Li, D. 2013. Innovative efficiency and stock returns. *Journal of Financial Economics,* 107, 632-654.

Hirshleifer, D., Low, A. & Teoh, S. H. 2012. Are overconfident CEOs better innovators? *Journal of Finance,* 67, 1457-1498.

Holmstrom, B. 1989. Agency costs and innovation. *Journal of Economic Behavior & Organization,* 12, 305-327.

Humphery-Jenner, M. 2012. Internal and external discipline following securities class actions. *Journal of Financial Intermediation,* 21, 151-179.

Ioannidou, V. & Ongena, S. 2010. "Time for a change": Loan conditions and bank behavior when firms switch banks. *Journal of Finance,* 65, 1847-1877.

Issacharoff, S. & Eagles, T. 2015. Australian alternative: A view from abroad of recent developments in securities class actions. *UNSW Law Journal,* 38, 179-205.

Ivashina, V. & Sun, Z. 2011. Institutional demand pressure and the cost of corporate loans. *Journal of Financial Economics,* 99, 500-522.

Jackson, H. E. & Roe, M. J. 2009. Public and private enforcement of securities laws: Resource-based evidence. *Journal of Financial Economics,* 93, 207-238.

Jiangli, W., Unal, H. & Yom, C. 2008. Relationship lending, accounting disclosure, and credit availability during the Asian financial crisis. *Journal of Money, Credit and Banking,* 40, 25-55.

Jin-Hyuk, K. 2008. Corporate lobbying revisited. *Business & Politics,* 10, 1-23.

Johnson, M. F., Nelson, K. K. & Pritchard, A. 2007. Do the merits matter more? The impact of the private securities litigation reform act. *Journal of Law, Economics, and Organization,* 23, 627-652.

Jones, C. L. & Weingram, S. E. 1996. The determinants of 10b-5 litigation risk. Working Paper, George Washington University.

Jones, R. A. & Wu, Y. W. 2010. Executive compensation, earnings management and shareholder litigation. *Review of Quantitative Finance and Accounting,* 35, 1-20.

Jorion, P. & Zhang, G. 2009. Credit contagion from counterparty risk. *Journal of Finance,* 64, 2053-2087.

Karaca-Mandic, P., Norton, E. C., & Dowd, B. 2012. Interaction terms in nonlinear models. *Health Services Research,* 47, 255-274.

Karpoff, J. M. & Lott, J. R., Jr. 1993. The reputational penalty firms bear from committing criminal fraud. *Journal of Law and Economics,* 36, 757-802.

Karpoff, J. M., Lee, D. S. & Martin, G. S. 2007. The legal penalties for financial misrepresentation. Working Paper, University of Washington.

Karpoff, J. M., Lee, D. S. & Martin, G. S. 2008a. The cost to firms of cooking the books. *Journal of Financial and Quantitative Analysis,* 43, 581-611.

Karpoff, J. M., Lee, D. S. & Martin, G. S. 2008b. The consequences to managers for financial misrepresentation. *Journal of Financial Economics,* 88, 193-215.

Khanna, V., Kim, E. H. & Lu, Y. 2015. CEO connectedness and corporate fraud. *Journal of Finance,* 70, 1203-1252.

Kim, I. & Skinner, D. J. 2012. Measuring securities litigation risk. *Journal of Accounting and Economics,* 53, 290-310.

Kim, M., Kliger, D. & Vale, B. 2003. Estimating switching costs: The case of banking. *Journal of Financial Intermediation,* 12, 25-56.

Kogan, L., Papanikolaou, D., Seru, A. & Stoffman, N. 2017. Technological innovation, resource allocation, and growth. *The Quarterly Journal of Economics,* 132, 665-712.

Koh, P. S. & Reeb, D. M. 2015. Missing R&D. *Journal of Accounting and Economics,* 60, 73-94.

La Porta, R., Lopez-De-Silanes, F. & Shleifer, A. 2006. What works in securities laws? *Journal of Finance,* 61, 1-32.

Lee, S. W. & Mullineaux, D. J. 2004. Monitoring, financial distress, and the structure of commercial lending syndicates. *Financial Management,* 33, 107-130.

Lerner, J. & Wulf, J. Innovation and incentives: Evidence from corporate R&D. *The Review of Economics and Statistics,* 89, 634-644.

Lerner, J. 2010. The litigation of financial innovations. *The Journal of Law and Economics,* 53, 807-831.

Lin, H. & Paravisini, D. 2011. What's bank reputation worth? The effect of fraud on financial contracts and investment. Working Paper, IMF.

Longhofer, S. D. & Santos, J. A. C. 2000. The importance of bank seniority for relationship lending. *Journal of Financial Intermediation,* 9, 57-89.

Mahoney, P. G. 1995. Mandatory disclosure as a solution to agency problems. *The University of Chicago Law Review,* 62, 1047-1112.

Manso, G. 2011. Motivating innovation. *Journal of Finance,* 66, 1823-1860.

Marciukaityte, D., Szewczyk, S. H., Uzun, H. & Varma, R. 2006. Governance and performance changes after accusations of corporate fraud. *Financial Analysts Journal,* 62, 32-41.

Mathur, I., Singh, M., Thompson, F. & Nejadmalayeri, A. 2013. Corporate governance and

lobbying strategies. *Journal of Business Research,* 66, 547-553.

McTier, B. C. & Wald, J. K. 2011. The causes and consequences of securities class action litigation. *Journal of Corporate Finance,* 17, 649-665.

McVay, S. E. 2006. Earnings management using classification shifting: An examination of core earnings and special items. *The Accounting Review,* 81, 501-531.

Michaely, R. & Womack, K. L. 1999. Conflict of interest and the credibility of underwriter analyst recommendations. *Review of Financial Studies,* 12, 653-686.

Monestier, T. J. 2011. Is Canada the new Shangri-La of global securities class actions. *Northwestern Journal of International Law & Business*. 32, 305-364.

Mullenix, L. S. 2014. Ending class actions as we know them: Rethinking the American class action. Working Paper, University of Texas.

Murphy, B. & Cameron, C. 2006. Access to justice and the evolution of class action litigation in Australia. *Melbourne University Law Review,* 30, 399-440.

NERA. 2017. Recent trend in securities class action litigation: 2016 full-year review.

Niehaus, G. & Roth, G. 1999. Insider trading, equity issues, CEO turnover in firms subject to securities class action. *Financial Management,* 28, 52-72.

Nye, J. S. 1990. Soft power. *Foreign Policy,* 153-171.

Ongena, S. & Smith, D. C. 2000. Bank relationships: A review. *The Performance of Financial Institutions,* Cambridge University Press, 221-258.

Oppel, R. A. 2002. Merrill replaced research analyst who upset Enron. *The New York Times,* 30 July, Available from: http://www.nytimes.com/2002/07/30/business/merrill-replaced-research-analyst-who-upset-enron.html

Peng, L. & Roell, A. 2008. Executive pay and shareholder litigation. *Review of Finance,* 12, 141-184.

Petersen, M. A. & Rajan, R. G. 1994. The benefits of lending relationships: Evidence from small business data. *Journal of Finance,* 49, 3-37.

Petersen, M. A. & Rajan, R. G. 1995. The effect of credit market competition on lending relationships. *The Quarterly Journal of Economics,* 110, 407-443.

Prilmeier, R. 2017. Why do loans contain covenants? Evidence from lending relationships. *Journal of Financial Economics,* 123, 558-579.

Rajan, R. G. 1992. Insiders and outsiders: The choice between informed and arm's-length debt. *Journal of Finance,* 47, 1367-1400.

Romano, R. 1991. The shareholder suit: Litigation without foundation? *Journal of Law,*

Economics, and Organization, 7, 55-87.

Rosenfeld, C. M. 2014. The effect of banking relationships on the future of financially distressed firms. *Journal of Corporate Finance,* 25, 403-418.

Ross, D. G. 2010. The "dominant bank effect:" How high lender reputation affects the information content and terms of bank loans. *Review of Financial Studies,* 23, 2730-2756.

Scharfstein, D. S. & Stein, J. C. 1990. Herd behavior and investment. *American Economic Review,* 80, 465-479.

Schenone, C. 2010. Lending relationships and information rents: Do banks exploit their information advantages? *Review of Financial Studies,* 23, 1149-1199.

Schwartz, J. 2002. Enron's collapse: The analyst; man who doubted Enron enjoys recognition. *The New York Times*, 21 January, Available from: http://www.nytimes.com/2002/01/21/business/enron-s-collapse-the-analyst-man-who-doubted-enron-enjoys-new-recognition.html

Sharpe, S. A. 1990. Asymmetric information, bank lending, and implicit contracts: A stylized model of customer relationships. *Journal of Finance,* 45, 1069-1087.

Shleifer, A. 2005. Understanding regulation. *European Financial Management,* 11, 439-451.

Strahan, P. E. 1998. Securities class actions, corporate governance and managerial agency problems. Working paper, Federal Reserve Bank of New York.

Sufi, A. 2007. Information asymmetry and financing arrangements: Evidence from syndicated loans. *Journal of Finance*, 62, 629-668.

The Economist. 2015. The Washington wishing-well. *The Economist*, 13 June, Available from: http://www.economist.com/news/business/21654067-unstoppable-rise-lobbying-american-business-bad-business-itself-washington

Welsh, M. & Morabito, V. 2014. Public v private enforcement of securities laws: An Australian empirical study. *Journal of Corporate Law Studies,* 14, 39-78.

Wicks, A. 2015. Class actions in New Zealand: Is legislation still necessary? *New Zealand Law Review,* 2015, 2015, 73-114.

Yu, F. & Yu, X. 2011. Corporate lobbying and fraud detection. *Journal of Financial and Quantitative Analysis,* 46, 1865-1891.

Yuan, Q. & Zhang, Y. 2014. The real effects of corporate fraud: Evidence from class action lawsuits. *Accounting & Finance,* 56, 1-33.

Yuan, Q. & Zhang, Y. 2015. Do banks price litigation risk in debt contracting? Evidence from class action lawsuits. *Journal of Business Finance & Accounting,* 42, 1310-1340.

Appendix A:

Diff-in-Diff-in-Diff Estimation for the Impact a Relationship with a Bank has on Loan Features

This appendix presents complete results for the robustness tests performed in Chapter 2 that examine the change in loan terms following the filing of a class action (see Section 2.4.4.2).[60] The models reported in Appendix A.1 to A.7 were estimated using equation (2.7). The dependent variable is one of the seven loan characteristics that were examined in Chapter 2. The characteristics include: loan spread, maturity, number of covenants, loan size, collateral, syndicate size and the percentage of the loan held by the lead arranger.[61]

Each table in this appendix reports models that were estimated for the entire sample of sued and corresponding matched firms (*All* columns). The sample of was then split into two based on the outcome of the case. Estimates obtained from running the regression on the sample of sued and the corresponding matched firms where the case was dismissed are reported in the *Dismissed* columns. Similarly, estimates for the sample of sued and the corresponding matched firms where the case was settled are reported in the *Settled* columns. A summary of these results when the case is settled is reported in Table 2.17.[62]

[60] These robustness tests are used to check the validity of Hypothesis 3 from Chapter 2.
[61] See Table 2.1 for variable definitions.
[62] See Section 2.4.4.2 for a discussion of these results.

Appendix A.1: Impact a Relationship with a Bank has on Loan Spread – Diff-in-Diff-in-Diff

Appendix A.1 reports OLS regression estimates for the effect the filing of a class action has on loan spread, using equation (2.7). The dependent variable in these regressions is the natural log of the loan spread. Robust standard errors clustered at the firm level are reported in parentheses. Variable definitions can be found in Table 2.1. *, **, *** Statistically different from zero at the 10, 5 and 1 percent significance levels, respectively.

	Loan Spread					
	All		Dismissed		Settled	
Sued	0.105***	-0.009	0.094***	0.084	0.125***	-0.078
	(0.02)	(0.05)	(0.03)	(0.07)	(0.02)	(0.08)
PostFiling	-0.004	-0.028	-0.012	0.016	0.012	-0.054
	(0.01)	(0.03)	(0.01)	(0.05)	(0.01)	(0.04)
PreRel		-0.079***		-0.028		-0.127***
		(0.02)		(0.03)		(0.03)
PostFiling * Sued	0.149***	0.321***	0.119***	-0.005	0.172***	0.727***
	(0.03)	(0.11)	(0.04)	(0.12)	(0.04)	(0.16)
PreRel * Sued		0.127**		0.011		0.226***
		(0.06)		(0.08)		(0.08)
PreRel * PostFiling		0.031		-0.027		0.079*
		(0.03)		(0.05)		(0.04)
PreRel * PostFiling * Sued		-0.187*		0.128		-0.588***
		(0.11)		(0.13)		(0.16)
Size	-0.285***	-0.283***	-0.290***	-0.289***	-0.282***	-0.279***
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Leverage	0.673***	0.674***	0.641***	0.644***	0.661***	0.662***
	(0.03)	(0.03)	(0.03)	(0.03)	(0.04)	(0.04)
ROA	-0.577***	-0.584***	-1.106***	-1.108***	-0.350***	-0.356***
	(0.09)	(0.09)	(0.11)	(0.11)	(0.10)	(0.10)
B/M	-0.010***	-0.010***	-0.016***	-0.016***	-0.008***	-0.008***
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Tangibles	-0.252***	-0.253***	-0.231***	-0.231***	-0.247***	-0.248***
	(0.02)	(0.02)	(0.03)	(0.03)	(0.03)	(0.03)
Dividends	-7.479***	-7.444***	-8.487***	-8.472***	-6.574***	-6.538***
	(0.91)	(0.91)	(1.20)	(1.20)	(1.24)	(1.24)
Term Spread	0.118*	0.120*	0.201***	0.200***	-0.120	-0.121
	(0.07)	(0.07)	(0.07)	(0.07)	(0.13)	(0.13)
Credit Spread	0.463*	0.464*	0.742***	0.740***	-0.237	-0.307
	(0.25)	(0.25)	(0.28)	(0.28)	(0.50)	(0.50)
Intercept	6.999***	7.041***	6.631***	6.650***	8.144***	8.279***
	(0.40)	(0.40)	(0.45)	(0.45)	(0.81)	(0.81)
Industry Fixed Effect	Yes	Yes	Yes	Yes	Yes	Yes
Year Fixed Effect	Yes	Yes	Yes	Yes	Yes	Yes
R^2	0.54	0.54	0.57	0.57	0.52	0.52
N	28,274	28,274	13,547	13,547	14,727	14,727

Appendix A.2: Impact a Relationship with a Bank has on Loan Size – Diff-in-Diff-in-Diff

Appendix A.2 reports OLS regression estimates for the effect the filing of a class action has on loan size, using equation (2.7). The dependent variable in these regressions is the natural log of the size of the loan. Robust standard errors clustered at the firm level are reported in parentheses. Variable definitions can be found in Table 2.1. *, **, *** Statistically different from zero at the 10, 5 and 1 percent significance levels, respectively.

	Loan Size					
	All		Dismissed		Settled	
Sued	-0.163***	-0.075	-0.162***	-0.193	-0.149***	-0.009
	(0.03)	(0.08)	(0.04)	(0.13)	(0.05)	(0.11)
PostFiling	0.027*	-0.097*	0.009	-0.134*	0.026	-0.123
	(0.01)	(0.05)	(0.02)	(0.08)	(0.02)	(0.08)
PreRel		0.032		0.084*		-0.026
		(0.03)		(0.04)		(0.04)
PostFiling * Sued	0.089**	-0.061	0.085	0.099	0.086	-0.200
	(0.05)	(0.15)	(0.06)	(0.21)	(0.06)	(0.22)
PreRel * Sued		-0.095		0.034		-0.154
		(0.09)		(0.14)		(0.12)
PreRel * PostFiling		0.127**		0.144*		0.157**
		(0.06)		(0.08)		(0.08)
PreRel * PostFiling * Sued		0.160		-0.012		0.302
		(0.16)		(0.22)		(0.23)
Size	0.414***	0.412***	0.403***	0.399***	0.428***	0.428***
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
Leverage	0.446***	0.441***	0.480***	0.471***	0.444***	0.440***
	(0.04)	(0.04)	(0.06)	(0.06)	(0.05)	(0.05)
ROA	-0.247***	-0.244***	-0.121	-0.114	-0.293***	-0.292***
	(0.07)	(0.07)	(0.13)	(0.13)	(0.09)	(0.09)
B/M	0.010***	0.010***	0.009***	0.009***	0.011***	0.011***
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Tangibles	0.086***	0.084***	0.173***	0.172***	0.032	0.028
	(0.03)	(0.03)	(0.04)	(0.04)	(0.04)	(0.04)
Dividends	3.923***	3.880***	4.896***	4.824***	2.986***	2.965***
	(0.56)	(0.56)	(0.66)	(0.66)	(0.80)	(0.79)
Term Spread	-0.223**	-0.224**	-0.370***	-0.375***	0.051	0.056
	(0.11)	(0.11)	(0.13)	(0.13)	(0.20)	(0.20)
Credit Spread	-1.158***	-1.167***	-1.474***	-1.511***	-0.546	-0.499
	(0.41)	(0.41)	(0.49)	(0.49)	(0.75)	(0.75)
Intercept	18.248***	18.258***	18.986***	19.004***	16.858***	16.838***
	(0.66)	(0.66)	(0.78)	(0.78)	(1.19)	(1.19)
Industry Fixed Effect	Yes	Yes	Yes	Yes	Yes	Yes
Year Fixed Effect	Yes	Yes	Yes	Yes	Yes	Yes
R^2	0.33	0.33	0.33	0.33	0.34	0.34
N	33,427	33,427	16,092	16,092	17,335	17,335

Appendix A.3: Impact a Relationship with a Bank has on Loan Maturity – Diff-in-Diff-in-Diff

Appendix A.3 reports OLS regression estimates for the effect the filing of a class action has on loan maturity, using equation (2.7). The dependent variable in these regressions is the natural log of the number of months until maturity of the loan. Robust standard errors clustered at the firm level are reported in parentheses. Variable definitions can be found in Table 2.1. *, **, *** Statistically different from zero at the 10, 5 and 1 percent significance levels, respectively.

	Loan Maturity					
	All		Dismissed		Settled	
Sued	0.046**	-0.064	0.029	-0.001	0.060**	-0.107
	(0.02)	(0.06)	(0.03)	(0.09)	(0.03)	(0.08)
PostFiling	-0.003	-0.137***	-0.016	-0.135***	0.014	-0.121**
	(0.01)	(0.03)	(0.01)	(0.05)	(0.01)	(0.05)
PreRel		-0.060***		-0.074***		-0.044
		(0.02)		(0.03)		(0.03)
PostFiling * Sued	-0.053**	0.087	-0.027	0.115	-0.071**	-0.009
	(0.03)	(0.10)	(0.04)	(0.14)	(0.04)	(0.14)
PreRel * Sued		0.123*		0.036		0.187**
		(0.06)		(0.09)		(0.09)
PreRel * PostFiling		0.144***		0.130***		0.144***
		(0.03)		(0.05)		(0.05)
PreRel * PostFiling * Sued		-0.154		-0.153		-0.080
		(0.10)		(0.14)		(0.15)
Size	-0.069***	-0.069***	-0.069***	-0.068***	-0.071***	-0.072***
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Leverage	0.394***	0.390***	0.416***	0.413***	0.377***	0.374***
	(0.02)	(0.02)	(0.03)	(0.03)	(0.03)	(0.03)
ROA	0.201***	0.199***	0.290***	0.283***	0.171***	0.170***
	(0.04)	(0.04)	(0.07)	(0.07)	(0.05)	(0.05)
B/M	-0.002***	-0.002***	-0.002*	-0.002*	-0.002***	-0.002***
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Tangibles	-0.033*	-0.035*	-0.095***	-0.098***	0.014	0.012
	(0.02)	(0.02)	(0.03)	(0.03)	(0.02)	(0.02)
Dividends	-3.065***	-3.066***	-4.029***	-4.011***	-2.192***	-2.209***
	(0.44)	(0.44)	(0.59)	(0.59)	(0.55)	(0.56)
Term Spread	-0.516***	-0.515***	-0.555***	-0.554***	-0.439***	-0.437***
	(0.06)	(0.06)	(0.07)	(0.07)	(0.11)	(0.11)
Credit Spread	-1.933***	-1.938***	-2.151***	-2.151***	-1.445***	-1.418***
	(0.23)	(0.22)	(0.26)	(0.26)	(0.42)	(0.42)
Intercept	7.878***	7.936***	8.326***	8.381***	7.011***	7.029***
	(0.36)	(0.36)	(0.42)	(0.42)	(0.66)	(0.65)
Industry Fixed Effect	Yes	Yes	Yes	Yes	Yes	Yes
Year Fixed Effect	Yes	Yes	Yes	Yes	Yes	Yes
R^2	0.21	0.21	0.22	0.22	0.21	0.21
N	31,491	31,491	15,278	15,278	16,213	16,213

Appendix A.4: Impact a Relationship with a Bank has on Loan Collateral – Diff-in-Diff-in-Diff

Appendix A.4 reports logit regression estimates for the effect the filing of a class action has on loan collateral, using equation (2.7). The dependent variable in these regressions takes the value of one if the loan requires collateral. Robust standard errors clustered at the firm level are reported in parentheses. Variable definitions can be found in Table 2.1. *, **, *** Statistically different from zero at the 10, 5 and 1 percent significance levels, respectively.

	Loan Collateral					
	All		Dismissed		Settled	
Sued	0.458***	-0.027	0.606***	-0.337	0.346***	-0.026
	(0.00)	(0.92)	(0.00)	(0.45)	(0.00)	(0.94)
Post Filing	-0.018	-0.283*	-0.134**	-0.138	0.075	-0.433*
	(0.69)	(0.08)	(0.04)	(0.58)	(0.25)	(0.05)
Pre-Rel		-0.315***		-0.327**		-0.352**
		(0.00)		(0.02)		(0.01)
Post Filing * Sued	0.027	0.051*	0.033	0.060*	-0.003	0.057
	(0.02)	(0.02)	(0.03)	(0.04)	(0.15)	(0.04)
Pre-Rel * Sued		0.063		0.244***		-0.128
		(0.06)		(0.09)		(0.08)
Pre-Rel * Post Filing		0.055		0.021		0.049
		(0.03)		(0.05)		(0.05)
Pre-Rel * Post Filing * Sued		-0.110		0.052		-0.291**
		(0.11)		(0.17)		(0.12)
Size	-0.879***	-0.874***	-0.932***	-0.927***	-0.863***	-0.859***
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Leverage	2.920***	2.921***	2.899***	2.909***	2.983***	2.982***
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
ROA	-3.961***	-3.978***	-4.576***	-4.600***	-3.724***	-3.733***
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
B/M	-0.033***	-0.033***	-0.079***	-0.080***	-0.023***	-0.023***
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Tangibles	-0.782***	-0.789***	-0.938***	-0.952***	-0.671***	-0.671***
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Term Spread	0.248	0.250	-0.020	-0.017	1.022	1.042
	(0.45)	(0.45)	(0.96)	(0.97)	(0.12)	(0.11)
Credit Spread	-1.266	-1.265	-1.367	-1.386	-3.153	-3.340
	(0.31)	(0.31)	(0.38)	(0.38)	(0.17)	(0.15)
Intercept	7.226	7.466	8.763	9.035	7.380	7.812
	(0.32)	(0.30)	(0.57)	(0.55)	(0.71)	(0.70)
Industry Fixed Effect	Yes	Yes	Yes	Yes	Yes	Yes
Year Fixed Effect	Yes	Yes	Yes	Yes	Yes	Yes
Pseudo R^2	0.40	0.40	0.42	0.43	0.44	0.44
N	18167	18167	8787	8787	9380	9380

Appendix A.5: Impact a Relationship with a Bank has on Loan Covenants – Diff-in-Diff-in-Diff

Appendix A.5 reports poisson regression estimates for the effect the filing of a class action has on loan covenants, using equation (2.7). The dependent variable in these regressions is the number of covenants in the loan contract. Robust standard errors clustered at the firm level are reported in parentheses. Variable definitions can be found in Table 2.1. *, **, *** Statistically different from zero at the 10, 5 and 1 percent significance levels, respectively.

	Number of Covenants					
	All		Dismissed		Settled	
Sued	0.031	-0.038	0.009	-0.074	0.053	0.007
	(0.20)	(0.56)	(0.80)	(0.43)	(0.12)	(0.94)
PostFiling	-0.017	-0.086**	-0.035*	-0.129**	-0.001	-0.045
	(0.17)	(0.03)	(0.05)	(0.02)	(0.95)	(0.42)
PreRel		-0.025		-0.041		0.000
		(0.28)		(0.20)		(1.00)
PostFiling * Sued	-0.027	0.012	-0.010	0.081	-0.047	-0.060
	(0.43)	(0.93)	(0.84)	(0.65)	(0.31)	(0.79)
PreRel * Sued		0.082		0.098		0.053
		(0.25)		(0.33)		(0.60)
PreRel * PostFiling		0.076*		0.105*		0.047
		(0.07)		(0.08)		(0.42)
PreRel * PostFiling * Sued		-0.051		-0.107		0.006
		(0.72)		(0.56)		(0.98)
Size	-0.105***	-0.105***	-0.116***	-0.115***	-0.099***	-0.100***
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Leverage	0.352***	0.349***	0.298***	0.293***	0.386***	0.385***
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
ROA	0.032	0.031	0.012	0.009	0.058	0.059
	(0.52)	(0.54)	(0.89)	(0.92)	(0.33)	(0.33)
B/M	-0.002**	-0.002**	-0.015***	-0.016***	-0.001	-0.001
	(0.04)	(0.04)	(0.00)	(0.00)	(0.22)	(0.21)
Tangibles	-0.104***	-0.105***	-0.126***	-0.129***	-0.088***	-0.088***
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Dividends	-2.473***	-2.465***	-2.361***	-2.339***	-2.470***	-2.471***
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Term Spread	0.038	0.040	-0.028	-0.029	0.170	0.176
	(0.72)	(0.71)	(0.83)	(0.82)	(0.37)	(0.35)
Credit Spread	-0.021	-0.015	-0.186	-0.202	0.202	0.252
	(0.96)	(0.97)	(0.71)	(0.69)	(0.78)	(0.73)
Intercept	1.488**	1.504**	1.978**	2.035**	0.819	0.767
	(0.02)	(0.02)	(0.01)	(0.01)	(0.47)	(0.50)
Industry Fixed Effect	Yes	Yes	Yes	Yes	Yes	Yes
Year Fixed Effect	Yes	Yes	Yes	Yes	Yes	Yes
Pseudo R^2	0.39	0.39	0.52	0.53	0.36	0.37
N	15,695	15,695	7,537	7,537	8,158	8,158

Appendix A.6: Impact a Relationship with a Bank has on Syndicate Size – Diff-in-Diff-in-Diff

Appendix A.6 reports negative binomial regression estimates for the effect the filing of a class action has on syndicate size, using equation (2.7). The dependent variable in these regressions is the number of participants in the loan syndicate. Robust standard errors clustered at the firm level are reported in parentheses. Variable definitions can be found in Table 2.1. *, **, *** Statistically different from zero at the 10, 5 and 1 percent significance levels, respectively.

	Syndicate Size					
	All		Dismissed		Settled	
Sued	0.022	0.062	-0.052*	-0.009	0.075***	0.078
	(0.26)	(0.35)	(0.06)	(0.93)	(0.01)	(0.37)
PostFiling	0.005	0.097**	-0.033**	0.020	0.031**	0.137***
	(0.62)	(0.01)	(0.03)	(0.72)	(0.04)	(0.01)
PreRel		0.089***		0.093***		0.082**
		(0.00)		(0.00)		(0.01)
PostFiling * Sued	-0.077***	-0.420***	0.027	-0.225	-0.155***	-0.591***
	(0.01)	(0.00)	(0.50)	(0.20)	(0.00)	(0.00)
PreRel * Sued		-0.045		-0.048		-0.005
		(0.51)		(0.65)		(0.96)
PreRel * PostFiling		-0.102***		-0.062		-0.117**
		(0.01)		(0.29)		(0.03)
PreRel * PostFiling * Sued		0.359***		0.267		0.448**
		(0.01)		(0.14)		(0.02)
Size	0.172***	0.170***	0.165***	0.162***	0.181***	0.179***
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Leverage	0.453***	0.453***	0.345***	0.345***	0.570***	0.569***
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
ROA	-0.059	-0.054	-0.029	-0.021	-0.041	-0.039
	(0.26)	(0.31)	(0.76)	(0.83)	(0.53)	(0.55)
B/M	0.005***	0.005***	0.004***	0.004***	0.005***	0.005***
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Tangibles	-0.033*	-0.032*	-0.027	-0.026	-0.033	-0.032
	(0.09)	(0.10)	(0.36)	(0.39)	(0.20)	(0.22)
Dividends	0.800***	0.780***	0.454	0.417	1.161***	1.147***
	(0.00)	(0.00)	(0.23)	(0.27)	(0.00)	(0.00)
Term Spread	0.078	0.075	0.035	0.030	0.097	0.097
	(0.36)	(0.38)	(0.73)	(0.77)	(0.52)	(0.52)
Credit Spread	0.258	0.256	0.083	0.067	0.669	0.704
	(0.43)	(0.44)	(0.83)	(0.87)	(0.25)	(0.22)
Intercept	0.527	0.479	0.891	0.858	0.028	-0.051
	(0.31)	(0.36)	(0.16)	(0.17)	(0.98)	(0.96)
Industry Fixed Effect	Yes	Yes	Yes	Yes	Yes	Yes
Year Fixed Effect	Yes	Yes	Yes	Yes	Yes	Yes
Pseudo R^2	0.12	0.12	0.13	0.13	0.16	0.17
N	33,444	33,444	16,100	16,100	17,344	17,344

Appendix A.7: Impact a Relationship with a Bank has on Loan Allocation – Diff-in-Diff-in-Diff

Appendix A.7 reports tobit regression estimates for the effect the filing of a class action has on lead allocation, using equation (2.7). The dependent variable in these regressions is the percentage of the loan retained by the lead arranger. Robust standard errors clustered at the firm level are reported in parentheses. Variable definitions can be found in Table 2.1. *, **, *** Statistically different from zero at the 10, 5 and 1 percent significance levels, respectively.

	Lead Allocation					
	All		Dismissed		Settled	
Sued	0.004	-0.091***	0.051***	-0.071	-0.032**	-0.099**
	(0.68)	(0.00)	(0.00)	(0.12)	(0.02)	(0.02)
PostFiling	-0.002	-0.021	0.009	-0.052**	-0.011	0.004
	(0.65)	(0.26)	(0.19)	(0.04)	(0.12)	(0.87)
PreRel		-0.075***		-0.079***		-0.076***
		(0.00)		(0.00)		(0.00)
PostFiling * Sued	0.047***	0.145**	0.002	0.183**	0.083***	0.117
	(0.00)	(0.03)	(0.93)	(0.03)	(0.00)	(0.26)
PreRel * Sued		0.104***		0.133***		0.073*
		(0.00)		(0.01)		(0.09)
PreRel * PostFiling		0.023		0.068***		-0.012
		(0.22)		(0.01)		(0.65)
PreRel * PostFiling * Sued		-0.107		-0.195**		-0.038
		(0.11)		(0.03)		(0.71)
Size	-0.051***	-0.049***	-0.052***	-0.051***	-0.052***	-0.050***
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Leverage	-0.103***	-0.103***	-0.083***	-0.084***	-0.123***	-0.124***
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
ROA	-0.040	-0.047*	-0.157***	-0.158***	0.013	0.000
	(0.13)	(0.08)	(0.00)	(0.00)	(0.70)	(0.99)
B/M	-0.001***	-0.001***	-0.005***	-0.005***	-0.001**	-0.001**
	(0.00)	(0.00)	(0.00)	(0.00)	(0.03)	(0.05)
Tangibles	-0.018*	-0.019*	0.008	0.008	-0.035***	-0.038***
	(0.06)	(0.05)	(0.58)	(0.58)	(0.01)	(0.00)
Dividends	-0.324***	-0.304***	-0.395**	-0.401**	-0.321**	-0.282**
	(0.00)	(0.01)	(0.05)	(0.04)	(0.02)	(0.05)
Term Spread	0.066*	0.070**	0.077*	0.081**	0.030	0.031
	(0.06)	(0.05)	(0.06)	(0.05)	(0.64)	(0.62)
Credit Spread	0.240*	0.250*	0.257	0.274*	0.109	0.095
	(0.09)	(0.08)	(0.12)	(0.10)	(0.67)	(0.71)
Intercept	0.320	0.330	0.291	0.311	0.500	0.554
	(0.15)	(0.14)	(0.27)	(0.23)	(0.22)	(0.17)
Industry Fixed Effect	Yes	Yes	Yes	Yes	Yes	Yes
Year Fixed Effect	Yes	Yes	Yes	Yes	Yes	Yes
Pseudo R^2	0.22	0.22	0.30	0.30	0.31	0.31
N	9,737	9,737	4,605	4,605	5,132	5,132

Appendix B:

Replication of Yu and Yu (2011)

This appendix presents a replication of the results obtained in the paper by Yu and Yu (2011). Yu and Yu's (2011) sample and method differs from the analysis conducted in Chapter 3 in several key ways. First, their sample period for SCAs was from 1998 to 2004, whereas in Chapter 3 the sample period analysed was from 2000 to 2012.

The second difference is in the lobbying data set that is used. Yu and Yu (2011) used lobbying data obtained from Political MoneyLine whereas in Chapter 3 lobbying data was obtained from the Centre for Responsive Politics (CRP) (see Section 3.3.4.1). The lobbying data Yu and Yu used in their analysis was also restricted so that the semi-annual lobbying expenditure was at least $250,000. A comparison of the annual lobbying each year for the sample period from 1998 to 2004 can be found in Appendix B.1. Panel A and B of Appendix B.1 show the annual lobbying spending breakdown found by Yu and Yu and the replication, respectively. The difference between these two panels is negligible.[63] Panel C of Appendix B.1 provides an annual breakdown of lobbying spending based on the lobbying data obtained from the CRP. Over the sample period the CRP dataset consists of a significantly larger number of firms that lobbied over the sample period and the average lobbying expenses are much smaller. These differences can primarily be attributed to the semi-annual restriction of $250,000 used in Yu and Yu's data.

[63] One aspect of the lobbying datasets that should be noted is that a unique identifier is not included, which means that a manual matching of company names had to be performed in order to merge the lobbying information with firm financial data. Therefore, it is possible that slight differences in the matches may occur.

Another difference in the method implemented by Yu and Yu (2011) and that implemented in Chapter 3 is how lobbying is defined. In their paper Yu and Yu define a lobbying firm as a firm that lobbies at any point in time from the 2nd half of 1998 to the 1st half of 2005. This definition of lobbying represents loosely whether firms are involved in politics. In Chapter 3, a firm is defined as a lobbying firm if they have undertaken lobbying during the two years prior to the filing year (see section 3.3.1 for further details). This definition of lobbying reflects not only the period when the alleged misconduct occurs but the two year time period is also a sufficient amount of time for political connections to have been developed (Snyder, 1992).

The final major difference is in the number of class actions that have been analysed. Yu and Yu (2011) specify that they use a sample of 205 class actions obtained from an analysis conducted by Dyck et al. (2010). For the purpose of the replication, a sample of 172 class actions has been used, which have been obtained from Professor Adair Morse's webpage.[64]

Appendix B.2 presents the number of class actions by the year in which the alleged misconduct began. Appendix B.3 provides a breakdown of a few key firm characteristics. In both of these tables, Panel A shows the results reported by Yu and Yu (2011) and Panel B is the breakdown for my replication sample. Some differences are evident between Yu and Yu's sample and the replication sample in these tables. However, these discrepancies are most likely driven by the differences in the number of class actions. For the purposes of this analysis, this sample should be adequate to replicate the results of Yu and Yu (2011).

The main focus of Yu and Yu (2011) is the relationship between the time it takes to detect fraud and a firm's lobbying activity. To examine this, the authors estimated a regression, where the dependent variable is the number of days in the class period (similar to equation (3.1)). The results of Yu and Yu's regressions as well as the replication can be found in Appendix B.4. The first two columns (Models 1 and 2) of Appendix B.4 depict the results that were obtained by Yu and Yu (2011). The next two columns (3 and 4) show the results from the replication. The results for these models are largely consistent. The key variables of interest are the dummy variable for lobbying activities and the average annual lobbying expense. These variables are all positive and significant indicating that

[64] http://faculty.haas.berkeley.edu/morse/data.html

lobbying activities are associated with longer class periods.[65] Although the coefficients for these two variables are significant in the replication regressions they are not as statistically significant as the results presented by Yu and Yu (2011). The dummy variable for lobbying in the replication sample is only significant at the 10% level and the average annual lobbying expenses variable is only significant at the 5% level. In contrast, Yu and Yu find that both of these variables are significant at the 1% level. The differences in the significance of the coefficients are likely a result of the slight differences in the sample of class actions being analysed. However, the differences in significance are relatively unimportant for the purposes of this replication. The key take away from this analysis is that during the period from 1998 to 2004 and using Yu and Yu's definition of lobbying there is evidence to suggest that lobbying firms were able to evade detection for longer.

[65] These results are also consistent with those reported for the pre-SOX period (models 1 and 2) in Table 3.11.

Appendix B.1: Comparison of Annual Lobbying Spending

Appendix B.1 presents a comparison of the annual lobbying expenditures. Panel A presents the annual lobbying statistics reported by Yu and Yu (2011). Panel B reports annual lobbying statistics obtained from my replication of Yu and Yu's (2011) results. Lobbying data for Panels A and B have been obtained from Political Money Line. Panel C presents reports annual lobbying statistics obtained from the Centre for Responsive Politics (CRP).

Panel A: Annual Spending on Lobbying: Yu and Yu (2011)

Year	Mean	Median	25th Percentile	75th Percentile	Standard Deviation	No. of Firms
1998	2,213.28	1,320.00	800	2,840	2,555.00	211
1999	1,894.71	1,120.00	660	2,480	1,970.66	242
2000	1,986.54	1,140.00	660	2,453	2,209.44	240
2001	1,926.71	1,140.00	598	2,696	2,120.87	251
2002	2,081.24	1,230.00	690	2,375	2,279.13	245
2003	1,985.61	1,138.95	620	2,220	2,367.86	280
2004	1,955.75	1,110.34	640	2,180	2,450.60	304
2005	2,199.17	1,335.60	760	2,590	2,549.87	280
Total	2,027.32	1,167.00	680	2,480	2,324.62	2,053

Panel B: Annual Spending on Lobbying: Replication

Year	Mean	Median	25th Percentile	75th Percentile	Standard Deviation	No. of Firms
1998	1,120.67	660.00	380	1,420	1,292.74	214
1999	1,932.30	1,120.00	680	2,600	2,011.68	234
2000	1,969.19	1,100.00	640	2,210	2,243.13	241
2001	1,990.52	1,148.34	620	2,696	2,250.59	250
2002	2,073.64	1,210.00	680	2,348	2,359.29	254
2003	2,018.14	1,140.00	660	2,280	2,420.21	281
2004	2,029.78	1,119.65	680	2,343	2,587.10	299
2005	1,105.15	640.00	383	1,280	1,295.66	283
Total	1,788.74	1,000.00	560	2,064	2,159.95	2,056

Panel C: Annual Spending on Lobbying: Centre for Responsive Politics

Year	Mean	Median	25th Percentile	75th Percentile	Standard Deviation	No. of Firms
1998	723.75	141.14	60	520	1,920.57	797
1999	645.40	160.00	60	481	1,595.23	828
2000	695.14	160.00	60	520	1,553.81	811
2001	697.34	160.00	60	538	1,566.52	848
2002	693.46	160.00	60	520	1,547.15	904
2003	697.75	180.00	80	560	1,586.51	981
2004	743.14	190.00	80	616	1,720.41	986
2005	733.09	200.00	80	549	1,791.45	1,063
Total	705.14	163.75	60	540	1,666.05	7,218

Appendix B.2: Comparison of the Number of Class Actions by Year When Class Period Began

Appendix B.2 shows the annual frequency and duration of frauds by the year when the class period began for the sample period from 1998 to 2004. Panel A presents the annual frequency and the mean and median length of the class period based on the year when the class period began that was reported by Yu and Yu (2011). Panel B presents the annual frequency and the mean and median length of the class period based on the year when the class period began obtained for a sample replicating Yu and Yu's results.

Panel A: Number of Class Actions by Year When Class Period Began: Yu and Yu (2011)

			Duration of Fraud (no. of days)	
Year When Fraud Began	Count	% of Total	Mean	Median
1995	3	1.46%	1,297	1,400
1996	1	0.49%	930	930
1997	19	9.27%	830	599
1998	40	19.51%	730	520
1999	42	20.49%	827	987
2000	42	20.49%	572	436
2001	33	16.10%	421	437
2002	14	6.83%	298	253
2003	10	4.88%	305	293
2004	1	0.49%	126	126
Total	205	100.00%	633	456

Panel B: Number of Class Actions by Year When Class Period Began: Replication

			Duration of Fraud (no. of days)	
Year When Fraud Began	Count	% of Total	Mean	Median
1995	2	1.16%	1,246	1,246
1996	2	1.16%	882	882
1997	20	11.63%	821	528
1998	30	17.44%	688	512
1999	33	19.19%	797	976
2000	41	23.84%	543	446
2001	28	16.28%	402	417
2002	12	6.98%	288	284
2003	3	1.74%	230	213
2004	1	0.58%	126	126
Total	172	100.00%	613	447

Appendix B.3: Comparison of the Characteristics of Firms Subject to Securities Class Actions

Appendix B.3 presents a comparison of characteristics of firms that are subject to a SCA for the sample period from 1998 to 2004. Panel A presents the mean and median values for lobbying and non-lobbying firms that were reported by Yu and Yu (2011). Panel B presents the mean and median values for lobbying and non-lobbying firms based on a replication of Yu and Yu's (2011) results. The market value of equity, book value of equity and the book-to-market ratio are all measured in the year prior to the detection year. The p-value reported is for testing the difference between the mean value for lobbying and non-lobbying firms.

Panel A: Characteristics of Firms Subject to a SCA: Yu and Yu (2011)

	Lobbying		Non-Lobbying		
	Mean	Median	Mean	Median	p-Value
Market Value of Equity	38,777.09	20,377.38	5,825.54	1,677.09	0.00
Book Value of Equity	11,902.49	6,569.38	1,743.31	699.35	0.00
Book-to-Market Ratio	0.88	0.28	0.58	0.40	0.38
Assets	53,206.35	24,917.91	9,530.54	2,541.22	0.00
Days In CP	711.12	510.00	594.17	417.00	0.10
Settlement Amount	513.29	78.50	195.51	19.00	0.00

Panel B: Characteristics of Firms Subject to a SCA: Replication

	Lobbying		Non-Lobbying		
	Mean	Median	Mean	Median	p-Value
Market Value of Equity	39,533.02	14,384.15	4,752.25	1,705.36	0.00
Book Value of Equity	12,576.85	6,320.41	1,401.21	704.20	0.00
Book-to-Market Ratio	0.42	0.37	0.56	0.38	0.20
Assets	54,523.95	27,172.50	6,084.87	2,343.06	0.00
Days In CP	693.72	537.00	644.28	521.00	0.52
Settlement Amount	492.08	99.25	45.29	16.00	0.02

Appendix B.4: Determinants of the Length of the Class Period

Appendix B.4 presents regressions for the effect lobbying has on the length of the class period, between 1998 and 2004. The dependent variable is the number of days in the class period. Models 1 and 2 are the results of these regressions reported by Yu and Yu (2011). Models 3 and 4 are the results of these regressions obtained from a replication of Yu and Yu's (2011) results. The dummy variable for lobbying activities is equal to 1 if a firm has lobbied at any point in time during the sample period of 1998 to 2004 and equals 0 otherwise. The average lobby spending equals the average annual amount spent on lobbying over the sample period from 1998 to 2004. *, **, *** Statistically different from zero at the 10, 5 and 1 percent significance levels, respectively.

	Dependent Variable: Number of Days in Class Period			
	(1)	(2)	(3)	(4)
Dummy for lobbying activities	349.19***		169.82*	
	(92.07)		(97.89)	
Average lobby spending		168.04***		123.28**
		(57.72)		(61.00)
Book-to-Market	-10.72	-4.66	-10.62	-17.97
	(16.13)	(16.24)	(39.70)	(39.92)
Size	-57.32**	-41.10*	-52.15*	-51.06**
	(22.53)	(21.86)	(27.34)	(25.66)
Intercept	987.38***	903.00***	1,113.23***	1,152.07***
	(175.85)	(175.65)	(226.93)	(229.10)
Industry Fixed Effect	Yes	Yes	Yes	Yes
No. of obs.	192	192	167	167
R^2	0.15	0.19	0.10	0.10

Appendix C:

Probability of Being Sued by Change in Innovation

This appendix presents results examining the probability of being sued based on the change in innovative activity, which are used to examine Hypothesis 2 from Chapter 4 (see Section 4.4.2). The models reported in Appendix C.1 and C.2 were estimated using equation (4.4) (Section 4.3.3). The dependent variable is a dummy variable that is equal to one if a firm is sued in year *t*.

The primary independent variables of interest in these tables are the innovation measures. In total eight innovation measures are used including; *R&D/Assets*, *Patents*, *Citations (Fixed)*, *Citations (Quasi)*, *Value Added*, *IE Patents*, *IE Citations (Fixed)* and *IE Citations (Quasi)*.[66] In Appendix C.1 the innovation measures are calculated based on the change in the level of the measure from *t-1* to *t-3*. In Appendix C.2 the innovation measures are calculated as the change in the level of the innovation variable from *t-1* to *t-3* less the change in the industry average change in the level of the innovation variable over the same period.

[66] See Section 4.3.1 for an overview of these measures and how they are calculated.

Appendix C.1: Probability of Being Sued by the Change in the Amount of Innovation

Appendix C.1 reports regression estimates for the probability of a firm being sued, using equation (4.4). The dependent variable in these regressions is a dummy variable equal to one if the firm is sued in year *t*. The eight innovation measures (*R&D/Assets*, *Patents*, *Citations (Fixed)*, *Citations (Quasi)*, *Value Added*, *IE Patents*, *IE Citations (Fixed)* and *IE Citations (Quasi)*) are calculated based on the change in the level of innovative activity from three years prior to one year prior (from *t-3* to *t-1*). Robust standard errors clustered at the firm level are reported in parentheses. Variables definitions can be found in Table 4.1. *, **, *** Statistically different from zero at the 10, 5 and 1 percent significance levels, respectively.

	Dependent Variable: Sued							
ΔR&D/Assets $_{t-1,t-3}$	-0.023							
	(0.16)							
ΔPatents $_{t-1,t-3}$		0.009						
		(0.06)						
ΔCitations (Fixed) $_{t-1,t-3}$			-0.040					
			(0.10)					
ΔCitations (Quasi) $_{t-1,t-3}$				-0.013				
				(0.03)				
ΔValue Added $_{t-1,t-3}$					-0.171***			
					(0.05)			
ΔIE Patents $_{t-1,t-3}$						-0.022		
						(0.02)		
ΔIE Citations (Fixed) $_{t-1,t-3}$							-0.002	
							(0.00)	
ΔIE Citations (Quasi) $_{t-1,t-3}$								0.000
								(0.00)
Size	0.381***	0.387***	0.388***	0.388***	0.378***	0.354***	0.368***	0.368***
	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.04)	(0.03)	(0.03)
Leverage	0.375**	0.378**	0.378**	0.378**	0.385**	0.394	0.450*	0.452*
	(0.17)	(0.17)	(0.17)	(0.17)	(0.17)	(0.26)	(0.25)	(0.25)

ROA	-0.202**	-0.196**	-0.195**	-0.195**	-0.184*	-0.517***	-0.214	-0.214
	(0.10)	(0.10)	(0.10)	(0.10)	(0.10)	(0.15)	(0.14)	(0.14)
Return	0.010	0.024	0.024	0.025	0.032	0.051	-0.127	-0.127
	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)	(0.05)	(0.08)	(0.08)
B/M	-0.002	-0.003	-0.003	-0.003	-0.003	-0.010	-0.009	-0.009
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.01)	(0.01)	(0.01)
Tangibles	-1.109***	-1.134***	-1.135***	-1.137***	-1.127***	-0.709**	-0.700**	-0.697**
	(0.23)	(0.23)	(0.23)	(0.23)	(0.23)	(0.30)	(0.27)	(0.27)
Dividends	-7.248*	-7.968**	-7.951**	-7.960**	-7.535**	-3.030	-4.932	-4.932
	(3.74)	(3.54)	(3.54)	(3.54)	(3.50)	(4.47)	(4.15)	(4.15)
Std Ret	0.036**	0.038***	0.038***	0.038***	0.037***	0.053**	0.039*	0.039*
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.02)	(0.02)	(0.02)
Beta	0.004	0.004	0.004	0.004	0.004	-0.001	-0.001	-0.001
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Skew	-0.190***	-0.191***	-0.191***	-0.191***	-0.192***	-0.181***	-0.210***	-0.210***
	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.03)	(0.02)	(0.02)
Intercept	-9.368	-9.107	-9.112	-9.112	-9.068	-10.352	-10.563	-10.570
	(63.27)	(79.37)	(79.30)	(79.31)	(76.83)	(182.96)	(152.66)	(152.68)
Industry Fixed Effect	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year Fixed Effect	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Pseudo R^2	0.15	0.15	0.15	0.15	0.15	0.14	0.14	0.14
N	17,430	18,463	18,463	18,462	18,463	7,427	10,555	10,553

Appendix C.2: Probability of Being Sued by the Relative Change in the Amount of Innovation

Appendix C.2 reports regression estimates for the probability of a firm being sued, using equation (4.4). The dependent variable in these regressions is a dummy variable equal to one if the firm is sued in year *t*. The eight innovation measures (*R&D/Assets*, *Patents*, *Citations (Fixed)*, *Citations (Quasi)*, *Value Added*, *IE Patents*, *IE Citations (Fixed)* and *IE Citations (Quasi)*) are calculated based on the change in the level of innovative activity from three years prior to one year prior (from *t-3* to *t-1*) relative to the change in the industry level of innovative activity over the same period. Robust standard errors clustered at the firm level are reported in parentheses. Variables definitions can be found in Table 4.1. *, **, *** Statistically different from zero at the 10, 5 and 1 percent significance levels, respectively.

	Dependent Variable: Sued							
ΔR&D/Assets$_{i\ t-1,t-3}$ - ΔR&D/Assets$_{ind\ t-1,t-3}$	-0.063							
	(0.15)							
ΔPatents$_{i\ t-1,t-3}$ - ΔPatents$_{ind\ t-1,t-3}$		0.010						
		(0.06)						
ΔCitations (Fixed)$_{i\ t-1,t-3}$ - ΔCitations (Fixed)$_{ind\ t-1,t-3}$			-0.055					
			(0.10)					
ΔCitations (Quasi)$_{i\ t-1,t-3}$ - ΔCitations (Quasi)$_{ind\ t-1,t-3}$				-0.019				
				(0.03)				
ΔValue Added$_{i\ t-1,t-3}$ - ΔValue Added$_{ind\ t-1,t-3}$					-0.179***			
					(0.05)			
ΔIE Patents$_{i\ t-1,t-3}$ - ΔIE Patents$_{ind\ t-1,t-3}$						-0.023		
						(0.02)		
ΔIE Citations (Fixed)$_{i\ t-1,t-3}$ - ΔIE Citations (Fixed)$_{ind\ t-1,t-3}$							-0.003	
							(0.00)	
ΔIE Citations (Quasi)$_{i\ t-1,t-3}$ - ΔIE Citations (Quasi)$_{ind\ t-1,t-3}$								0.000*
								(0.00)
Size	0.381***	0.387***	0.388***	0.388***	0.378***	0.354***	0.368***	0.368***
	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.04)	(0.03)	(0.03)
Leverage	0.372**	0.378**	0.378**	0.378**	0.385**	0.393	0.451*	0.453*
	(0.17)	(0.17)	(0.17)	(0.17)	(0.17)	(0.26)	(0.25)	(0.25)

ROA	-0.208**	-0.196**	-0.195**	-0.195**	-0.184*	-0.517***	-0.214	-0.213
	(0.10)	(0.10)	(0.10)	(0.10)	(0.10)	(0.15)	(0.14)	(0.14)
Return	0.010	0.024	0.024	0.025	0.033	0.051	-0.127	-0.126
	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)	(0.05)	(0.08)	(0.08)
B/M	-0.002	-0.003	-0.003	-0.003	-0.003	-0.009	-0.009	-0.009
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.01)	(0.01)	(0.01)
Tangibles	-1.105***	-1.134***	-1.135***	-1.137***	-1.126***	-0.709**	-0.698**	-0.695**
	(0.23)	(0.23)	(0.23)	(0.23)	(0.23)	(0.30)	(0.27)	(0.27)
Dividends	-7.239*	-7.967**	-7.935**	-7.946**	-7.515**	-3.034	-4.927	-4.925
	(3.73)	(3.53)	(3.54)	(3.54)	(3.50)	(4.47)	(4.15)	(4.14)
Std Ret	0.036**	0.038***	0.038***	0.038***	0.037***	0.053**	0.039*	0.039*
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.02)	(0.02)	(0.02)
Beta	0.004	0.004	0.004	0.004	0.004	-0.001	-0.001	-0.001
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Skew	-0.190***	-0.191***	-0.191***	-0.191***	-0.192***	-0.181***	-0.210***	-0.210***
	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.03)	(0.02)	(0.02)
Intercept	-9.372	-9.108	-9.111	-9.111	-9.059	-10.349	-10.564	-10.573
	(63.32)	(79.37)	(79.27)	(79.28)	(76.89)	(182.94)	(152.66)	(152.65)
Industry Fixed Effect	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year Fixed Effect	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Pseudo R^2	0.15	0.15	0.15	0.15	0.15	0.14	0.14	0.14
N	17,430	18,463	18,463	18,462	18,463	7,427	10,555	10,553

Appendix D:

Change in Innovation after the Filing of a SCA

This appendix presents results examining the level of innovative activity after the filing of a SCA, which are used to examine Hypothesis 3 from Chapter 4 (see Section 4.4.3). The models reported in Appendix D.1 to D.8 were estimated using equation (4.5) (Section 4.3.4). The dependent variable in these regressions is one of eight measures of innovation. These measures include *R&D/Assets, Patents, Citations (Fixed), Citations (Quasi), Value Added, IE Patents, IE Citations (Fixed)* and *IE Citations (Quasi)*.[67] The results obtained for regressions that were estimated for the sample of sued and corresponding matched firms where the case was settled are reported in Tables 4.10 to 4.17.[68]

[67] See Section 4.3.1 for an overview of these measures and how they are calculated.
[68] See Section 4.4.3 for a discussion of these results.

Appendix D.1: Impact of the Filing of a Class Action on R&D

Appendix D.1 reports regression estimates for the effect the filing of a class action has on R&D expenditures. The dependent variable in this regression is the ratio of R&D/Assets. The regressions were estimated for a sample of sued and propensity score matching sample of non-sued firms. R&D was analysed for a window of up to five years before and after the filing of a SCA. The first three columns (*All*) presents results obtained for regressions estimated on all sued and matched firms. Columns four to six (*Patent Pre-Filing*) reports regression estimates for the sample of sued firms that obtained at least one patent in the three years before the filing and the corresponding matched firm. The last three columns (*No-Patent Pre-Filing*) reports regression estimates for the sample of sued firms that did not obtain a patent in the three years before the filing and the corresponding matched firms. The first column in each grouping (*All-Sued*) reports regressions estimated for sued and non-sued firm in that category. The *Dismissed* and *Settled* columns report regressions for those cases that were dismissed and settled. Robust standard errors clustered at the firm level are reported in parentheses. Variables definitions can be found in Table 4.1. *, **, *** Statistically different from zero at the 10, 5 and 1 percent significance levels, respectively.

	Dependent Variable: R&D/Assets								
	All			Patent Pre-Filing			No-Patent Pre-Filing		
	All-Sued	Dismissed	Settled	All-Sued	Dismissed	Settled	All-Sued	Dismissed	Settled
Immediate	-0.003	-0.010***	0.002	-0.005	-0.010***	0.000	0.002	-0.003	0.006
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.01)	(0.00)
Post	-0.006*	-0.006	-0.006	-0.007*	-0.001	-0.012*	0.000	-0.009	0.006
	(0.00)	(0.00)	(0.00)	(0.00)	(0.01)	(0.01)	(0.00)	(0.01)	(0.01)
Sued	0.011***	0.012***	0.010**	0.028***	0.030***	0.026***	-0.021***	-0.024***	-0.019***
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.01)	(0.00)	(0.01)	(0.01)
Immediate * Sued	-0.018***	-0.007	-0.026***	-0.023***	-0.012	-0.031***	-0.009	0.007	-0.016
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
Post * Sued	-0.012*	-0.016*	-0.010	-0.020**	-0.036***	-0.008	0.001	0.031*	-0.018
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.02)	(0.01)
Size	-0.008***	-0.010***	-0.007***	-0.010***	-0.014***	-0.007***	-0.007***	-0.006***	-0.008***
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Leverage	-0.042***	-0.025***	-0.055***	-0.012**	0.022***	-0.040***	-0.086***	-0.097***	-0.081***
	(0.00)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)

ROA	-0.159***	-0.144***	-0.168***	-0.145***	-0.113***	-0.171***	-0.173***	-0.204***	-0.163***
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.01)	(0.00)	(0.01)	(0.00)
Return	-0.001*	-0.001	-0.001	-0.001	-0.001	-0.001	-0.002	0.000	-0.002
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
B/M	0.000*	-0.001***	0.000	0.000	-0.001***	0.000	0.000***	0.000**	0.000**
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Tangibles	-0.011***	-0.003	-0.015***	-0.026***	-0.012*	-0.031***	0.005	0.008	0.004
	(0.00)	(0.00)	(0.00)	(0.01)	(0.01)	(0.01)	(0.00)	(0.01)	(0.01)
Dividends	0.002	-0.016	0.012	0.021	0.041	0.018	-0.028	-0.084	0.009
	(0.03)	(0.04)	(0.04)	(0.04)	(0.05)	(0.06)	(0.04)	(0.05)	(0.05)
H-Index	-0.031	-0.011	-0.037	-0.144***	-0.110***	-0.154***	0.045*	0.022	0.063*
	(0.02)	(0.03)	(0.03)	(0.03)	(0.04)	(0.05)	(0.03)	(0.04)	(0.03)
H-Index^2	0.028	0.017	0.027	0.131***	0.112***	0.132**	-0.044	-0.017	-0.065*
	(0.02)	(0.03)	(0.03)	(0.04)	(0.04)	(0.06)	(0.03)	(0.04)	(0.04)
High-Tech	0.089***	0.095***	0.086***	0.063***	0.070***	0.059***	0.105***	0.104***	0.105***
	(0.00)	(0.00)	(0.00)	(0.00)	(0.01)	(0.01)	(0.00)	(0.01)	(0.00)
Intercept	0.162***	0.160***	0.166***	0.222***	0.211***	0.235***	0.111***	0.126***	0.099***
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.02)	(0.01)	(0.01)	(0.01)
Firm Fixed Effect	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year Fixed Effect	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
R^2	0.22	0.27	0.20	0.17	0.25	0.15	0.32	0.35	0.31
N	36,043	14,645	21,350	21,793	9,247	12,500	14,250	5,398	8,850

Appendix D.2: Impact of the Filing of a Class Action on the Number of Patents

Appendix D.2 reports regression estimates for the effect the filing of a class action has on the number of patents. The dependent variable in this regression is the log of one plus the number of patents. The regressions were estimated for a sample of sued and propensity score matching sample of non-sued firms. The number of patents were analysed for a window of up to five years before and after the filing of a SCA. The first three columns (*All*) presents results obtained for regressions estimated on all sued and matched firms. Columns four to six (*Patent Pre-Filing*) reports regression estimates for the sample of sued firms that obtained at least one patent in the three years before the filing and the corresponding matched firm. The last three columns (*No-Patent Pre-Filing*) reports regression estimates for the sample of sued firms that did not obtain a patent in the three years before the filing and the corresponding matched firms. The first column in each grouping (*All-Sued*) reports regressions estimated for sued and non-sued firm in that category. The *Dismissed* and *Settled* columns report regressions for those cases that were dismissed and settled. Robust standard errors clustered at the firm level are reported in parentheses. Variables definitions can be found in Table 4.1. *, **, *** Statistically different from zero at the 10, 5 and 1 percent significance levels, respectively.

	Dependent Variable: Patents								
	All			Patent Pre-Filing			No-Patent Pre-Filing		
	All-Sued	Dismissed	Settled	All-Sued	Dismissed	Settled	All-Sued	Dismissed	Settled
Immediate	-0.054***	-0.037	-0.060**	-0.034	-0.042	-0.024	-0.094***	-0.022	-0.144***
	(0.02)	(0.03)	(0.02)	(0.03)	(0.04)	(0.03)	(0.02)	(0.04)	(0.03)
Post	-0.008	0.002	-0.004	0.062*	0.040	0.090**	-0.136***	-0.057	-0.203***
	(0.03)	(0.04)	(0.03)	(0.04)	(0.06)	(0.05)	(0.03)	(0.06)	(0.04)
Sued	0.085***	0.153***	0.029	0.346***	0.428***	0.273***	-0.592***	-0.648***	-0.557***
	(0.03)	(0.05)	(0.03)	(0.04)	(0.06)	(0.05)	(0.04)	(0.07)	(0.04)
Immediate * Sued	-0.019	-0.007	-0.028	-0.042	-0.003	-0.081	0.124**	0.049	0.162**
	(0.04)	(0.07)	(0.05)	(0.06)	(0.09)	(0.07)	(0.06)	(0.10)	(0.06)
Post * Sued	0.039	0.109	-0.022	-0.108	0.036	-0.238**	0.233***	0.187	0.270***
	(0.06)	(0.10)	(0.07)	(0.07)	(0.12)	(0.10)	(0.08)	(0.14)	(0.09)
Size	0.488***	0.540***	0.444***	0.569***	0.620***	0.526***	0.245***	0.259***	0.229***
	(0.00)	(0.01)	(0.00)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
Leverage	0.251***	0.290***	0.256***	0.209***	0.209***	0.218***	0.144***	0.116	0.177***
	(0.04)	(0.06)	(0.04)	(0.05)	(0.08)	(0.06)	(0.05)	(0.08)	(0.05)

ROA	0.075***	0.055	0.092***	0.058*	0.002	0.117***	0.078***	0.188***	0.040
	(0.02)	(0.04)	(0.03)	(0.03)	(0.05)	(0.04)	(0.03)	(0.07)	(0.03)
Return	-0.081***	-0.070***	-0.084***	-0.082***	-0.072***	-0.086***	-0.048***	-0.034*	-0.051***
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.02)	(0.01)
B/M	0.007***	0.022***	0.006***	0.006***	0.031***	0.006***	0.015***	0.016***	0.014***
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Tangibles	0.614***	0.531***	0.642***	1.147***	0.990***	1.219***	0.237***	0.365***	0.169***
	(0.03)	(0.05)	(0.04)	(0.04)	(0.07)	(0.05)	(0.03)	(0.06)	(0.04)
R&D	1.023***	1.398***	0.845***	1.078***	1.451***	0.945***	0.628***	0.907***	0.503***
	(0.06)	(0.10)	(0.07)	(0.08)	(0.14)	(0.10)	(0.07)	(0.14)	(0.08)
Dividends	1.234***	1.501***	1.033***	0.898***	1.426**	0.593	0.301	-0.198	0.507*
	(0.22)	(0.40)	(0.25)	(0.32)	(0.59)	(0.37)	(0.24)	(0.46)	(0.27)
H-Index	4.646***	5.966***	3.689***	5.561***	7.463***	4.101***	2.399***	3.081***	1.789***
	(0.17)	(0.29)	(0.21)	(0.26)	(0.41)	(0.33)	(0.19)	(0.34)	(0.22)
H-Index^2	-4.195***	-5.533***	-3.174***	-5.217***	-7.525***	-3.328***	-2.045***	-2.669***	-1.465***
	(0.18)	(0.30)	(0.23)	(0.29)	(0.44)	(0.37)	(0.20)	(0.35)	(0.23)
High-Tech	1.083***	1.309***	0.937***	0.979***	1.197***	0.842***	0.779***	1.011***	0.625***
	(0.02)	(0.04)	(0.03)	(0.04)	(0.06)	(0.05)	(0.03)	(0.05)	(0.03)
Intercept	-4.159***	-4.935***	-3.606***	-4.913***	-5.741***	-4.321***	-1.919***	-2.368***	-1.572***
	(0.06)	(0.10)	(0.07)	(0.08)	(0.13)	(0.11)	(0.07)	(0.13)	(0.08)
Firm Fixed Effect	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year Fixed Effect	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
R^2	0.38	0.41	0.35	0.43	0.45	0.40	0.23	0.25	0.22
N	36,242	14,665	21,530	21,913	9,285	12,583	14,329	5,380	8,947

Appendix D.3: Impact of the Filing of a Class Action on the Number of Citations (Fixed)

Appendix D.3 reports regression estimates for the effect the filing of a class action has on the number of citations. The dependent variable in this regression is the log of one plus the number of citations per patent scaled by the average number of citations received by patents granted in the same year and in the same technology subcategory. The regressions were estimated for a sample of sued and propensity score matching sample of non-sued firms. The number of citations were analysed for a window of up to five years before and after the filing of a SCA. The first three columns (*All*) presents results obtained for regressions estimated on all sued and matched firms. Columns four to six (*Patent Pre-Filing*) reports regression estimates for the sample of sued firms that obtained at least one patent in the three years before the filing and the corresponding matched firm. The last three columns (*No-Patent Pre-Filing*) reports regression estimates for the sample of sued firms that did not obtain a patent in the three years before the filing and the corresponding matched firms. The first column in each grouping (*All-Sued*) reports regressions estimated for sued and non-sued firm in that category. The *Dismissed* and *Settled* columns report regressions for those cases that were dismissed and settled. Robust standard errors clustered at the firm level are reported in parentheses. Variables definitions can be found in Table 4.1. *, **, *** Statistically different from zero at the 10, 5 and 1 percent significance levels, respectively.

	Dependent Variable: Citations (Fixed)								
	All			Patent Pre-Filing			No-Patent Pre-Filing		
	All-Sued	Dismissed	Settled	All-Sued	Dismissed	Settled	All-Sued	Dismissed	Settled
Immediate	-0.029***	-0.026***	-0.030***	-0.032***	-0.030**	-0.033***	-0.015*	-0.001	-0.024**
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
Post	-0.037***	-0.030**	-0.041***	-0.022**	-0.010	-0.032**	-0.044***	-0.036*	-0.050***
	(0.01)	(0.01)	(0.01)	(0.01)	(0.02)	(0.02)	(0.01)	(0.02)	(0.02)
Sued	0.025***	0.019	0.028**	0.141***	0.127***	0.149***	-0.222***	-0.235***	-0.214***
	(0.01)	(0.01)	(0.01)	(0.01)	(0.02)	(0.02)	(0.01)	(0.02)	(0.02)
Immediate * Sued	0.000	-0.012	0.007	-0.022	-0.038	-0.013	0.067***	0.054	0.074***
	(0.01)	(0.02)	(0.02)	(0.02)	(0.03)	(0.02)	(0.02)	(0.04)	(0.03)
Post * Sued	0.023	0.018	0.028	-0.048**	-0.054	-0.043	0.141***	0.151***	0.137***
	(0.02)	(0.03)	(0.02)	(0.02)	(0.03)	(0.03)	(0.03)	(0.05)	(0.04)
Size	0.072***	0.072***	0.072***	0.070***	0.071***	0.069***	0.055***	0.051***	0.056***
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Leverage	-0.032***	-0.035**	-0.026*	-0.043***	-0.035	-0.049**	-0.021	-0.048*	-0.003
	(0.01)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.03)	(0.02)

ROA	0.039***	0.050***	0.031***	0.032***	0.042***	0.023	0.036***	0.067***	0.022*
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.02)	(0.01)
Return	0.000	0.006*	-0.004	0.002	0.006	-0.001	-0.001	0.006	-0.004
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.01)	(0.00)
B/M	0.001***	0.002***	0.001***	0.000***	0.001	0.000***	0.001***	0.001***	0.001**
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Tangibles	-0.002	-0.038**	0.021*	0.020	-0.024	0.047***	-0.018	-0.026	-0.007
	(0.01)	(0.01)	(0.01)	(0.01)	(0.02)	(0.02)	(0.01)	(0.02)	(0.02)
R&D	0.307***	0.401***	0.255***	0.278***	0.367***	0.229***	0.230***	0.316***	0.186***
	(0.02)	(0.03)	(0.02)	(0.03)	(0.04)	(0.03)	(0.03)	(0.05)	(0.03)
Dividends	-0.247***	-0.438***	-0.152*	-0.455***	-0.620***	-0.360***	-0.124	-0.355**	-0.023
	(0.07)	(0.12)	(0.09)	(0.10)	(0.17)	(0.12)	(0.09)	(0.16)	(0.11)
H-Index	0.636***	0.858***	0.498***	0.524***	0.879***	0.300***	0.392***	0.487***	0.312***
	(0.05)	(0.08)	(0.07)	(0.08)	(0.12)	(0.11)	(0.07)	(0.12)	(0.09)
H-Index^2	-0.503***	-0.692***	-0.380***	-0.385***	-0.730***	-0.148	-0.293***	-0.364***	-0.231**
	(0.06)	(0.09)	(0.08)	(0.09)	(0.13)	(0.13)	(0.07)	(0.12)	(0.09)
High-Tech	0.262***	0.298***	0.240***	0.197***	0.252***	0.163***	0.241***	0.270***	0.220***
	(0.01)	(0.01)	(0.01)	(0.01)	(0.02)	(0.02)	(0.01)	(0.02)	(0.01)
Intercept	-0.529***	-0.590***	-0.491***	-0.461***	-0.556***	-0.404***	-0.372***	-0.401***	-0.342***
	(0.02)	(0.03)	(0.03)	(0.03)	(0.04)	(0.04)	(0.03)	(0.04)	(0.03)
Firm Fixed Effect	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year Fixed Effect	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
R^2	0.16	0.18	0.14	0.14	0.16	0.12	0.15	0.17	0.14
N	36,242	14,665	21,530	21,913	9,285	12,583	14,329	5,380	8,947

Appendix D.4: Impact of the Filing of a Class Action on the Number of Citations (Quasi)

Appendix D.4 reports regression estimates for the effect the filing of a class action has on the number of citations. The dependent variable in this regression is the log of one plus the number of citations per patent multiplied by an adjustment factor obtained from the citation lag distribution. The regressions were estimated for a sample of sued and propensity score matching sample of non-sued firms. The number of citations were analysed for a window of up to five years before and after the filing of a SCA. The first three columns (*All*) presents results obtained for regressions estimated on all sued and matched firms. Columns four to six (*Patent Pre-Filing*) reports regression estimates for the sample of sued firms that obtained at least one patent in the three years before the filing and the corresponding matched firm. The last three columns (*No-Patent Pre-Filing*) reports regression estimates for the sample of sued firms that did not obtain a patent in the three years before the filing and the corresponding matched firms. The first column in each grouping (*All-Sued*) reports regressions estimated for sued and non-sued firm in that category. The *Dismissed* and *Settled* columns report regressions for those cases that were dismissed and settled. Robust standard errors clustered at the firm level are reported in parentheses. Variables definitions can be found in Table 4.1. *, **, *** Statistically different from zero at the 10, 5 and 1 percent significance levels, respectively.

	Dependent Variable: Citations (Quasi)								
	All			Patent Pre-Filing			No-Patent Pre-Filing		
	All-Sued	Dismissed	Settled	All-Sued	Dismissed	Settled	All-Sued	Dismissed	Settled
Immediate	-0.087***	-0.075**	-0.088***	-0.072***	-0.070*	-0.068*	-0.069**	-0.006	-0.109***
	(0.02)	(0.03)	(0.03)	(0.03)	(0.04)	(0.04)	(0.03)	(0.05)	(0.04)
Post	-0.100***	-0.074*	-0.112***	-0.028	0.005	-0.047	-0.153***	-0.105*	-0.191***
	(0.03)	(0.04)	(0.04)	(0.04)	(0.05)	(0.05)	(0.04)	(0.06)	(0.05)
Sued	0.136***	0.115***	0.146***	0.591***	0.543***	0.623***	-0.848***	-0.904***	-0.817***
	(0.03)	(0.04)	(0.04)	(0.04)	(0.05)	(0.05)	(0.04)	(0.07)	(0.06)
Immediate * Sued	-0.028	-0.038	-0.027	-0.136**	-0.133	-0.148*	0.277***	0.215*	0.310***
	(0.04)	(0.07)	(0.06)	(0.06)	(0.08)	(0.08)	(0.07)	(0.11)	(0.08)
Post * Sued	0.034	0.008	0.053	-0.269***	-0.293***	-0.256**	0.561***	0.592***	0.550***
	(0.06)	(0.09)	(0.08)	(0.07)	(0.11)	(0.10)	(0.10)	(0.16)	(0.12)
Size	0.283***	0.288***	0.277***	0.277***	0.283***	0.272***	0.201***	0.196***	0.198***
	(0.00)	(0.01)	(0.01)	(0.00)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
Leverage	-0.116***	-0.114**	-0.106**	-0.139***	-0.117*	-0.154**	-0.103*	-0.157*	-0.067
	(0.04)	(0.06)	(0.05)	(0.05)	(0.07)	(0.06)	(0.06)	(0.09)	(0.07)

ROA	0.159***	0.187***	0.137***	0.139***	0.157***	0.124***	0.138***	0.255***	0.089**
	(0.02)	(0.04)	(0.03)	(0.03)	(0.04)	(0.05)	(0.04)	(0.07)	(0.04)
Return	-0.012*	0.007	-0.022***	-0.005	0.007	-0.013	-0.015	0.010	-0.024*
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.02)	(0.01)
B/M	0.003***	0.007***	0.003***	0.002***	0.006	0.002***	0.006***	0.006***	0.006***
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Tangibles	0.174***	0.045	0.254***	0.309***	0.137**	0.416***	0.055	0.057	0.068
	(0.03)	(0.05)	(0.04)	(0.04)	(0.06)	(0.06)	(0.04)	(0.07)	(0.05)
R&D	1.012***	1.336***	0.836***	0.850***	1.128***	0.710***	0.760***	1.066***	0.610***
	(0.06)	(0.10)	(0.08)	(0.08)	(0.12)	(0.10)	(0.09)	(0.16)	(0.10)
Dividends	-0.351	-0.937**	-0.063	-0.994***	-1.357**	-0.759*	-0.133	-0.942*	0.239
	(0.22)	(0.38)	(0.27)	(0.31)	(0.54)	(0.39)	(0.29)	(0.50)	(0.35)
H-Index	3.240***	4.012***	2.750***	2.991***	4.264***	2.175***	1.912***	2.201***	1.629***
	(0.17)	(0.27)	(0.23)	(0.25)	(0.37)	(0.35)	(0.23)	(0.37)	(0.29)
H-Index^2	-2.703***	-3.378***	-2.250***	-2.432***	-3.721***	-1.521***	-1.530***	-1.744***	-1.299***
	(0.19)	(0.28)	(0.25)	(0.28)	(0.40)	(0.39)	(0.24)	(0.38)	(0.31)
High-Tech	1.067***	1.218***	0.973***	0.834***	1.052***	0.701***	0.913***	1.046***	0.822***
	(0.03)	(0.04)	(0.03)	(0.04)	(0.05)	(0.05)	(0.04)	(0.06)	(0.04)
Intercept	-2.392***	-2.651***	-2.219***	-2.227***	-2.556***	-2.024***	-1.529***	-1.723***	-1.356***
	(0.06)	(0.09)	(0.08)	(0.08)	(0.12)	(0.11)	(0.09)	(0.14)	(0.11)
Firm Fixed Effect	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year Fixed Effect	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
R^2	0.23	0.26	0.20	0.23	0.26	0.21	0.18	0.22	0.17
N	36,242	14,665	21,530	21,913	9,285	12,583	14,329	5,380	8,947

Appendix D.5: Impact of the Filing of a Class Action on the Value Added by Patents

Appendix D.5 reports regression estimates for the effect the filing of a class action has on the value added by patents. The dependent variable in this regression is the log of one plus the average value added per patent. The regressions were estimated for a sample of sued and propensity score matching sample of non-sued firms. The value added was analysed for a window of up to five years before and after the filing of a SCA. The first three columns (*All*) presents results obtained for regressions estimated on all sued and matched firms. Columns four to six (*Patent Pre-Filing*) reports regression estimates for the sample of sued firms that obtained at least one patent in the three years before the filing and the corresponding matched firm. The last three columns (*No-Patent Pre-Filing*) reports regression estimates for the sample of sued firms that did not obtain a patent in the three years before the filing and the corresponding matched firms. The first column in each grouping (*All-Sued*) reports regressions estimated for sued and non-sued firm in that category. The *Dismissed* and *Settled* columns report regressions for those cases that were dismissed and settled. Robust standard errors clustered at the firm level are reported in parentheses. Variables definitions can be found in Table 4.1. *, **, *** Statistically different from zero at the 10, 5 and 1 percent significance levels, respectively.

	Dependent Variable: Value Added								
	All			Patent Pre-Filing			No-Patent Pre-Filing		
	All-Sued	Dismissed	Settled	All-Sued	Dismissed	Settled	All-Sued	Dismissed	Settled
Immediate	-0.048***	-0.057**	-0.041**	-0.046**	-0.030	-0.050**	-0.037	-0.080*	-0.005
	(0.02)	(0.02)	(0.02)	(0.02)	(0.03)	(0.02)	(0.03)	(0.04)	(0.03)
Post	-0.052**	-0.007	-0.092***	-0.042*	0.038	-0.103***	-0.065*	-0.090	-0.042
	(0.02)	(0.03)	(0.03)	(0.03)	(0.04)	(0.03)	(0.04)	(0.06)	(0.05)
Sued	0.043**	0.015	0.060**	0.014	-0.032	0.047	0.319**	0.323	0.306
	(0.02)	(0.03)	(0.03)	(0.02)	(0.03)	(0.03)	(0.14)	(0.20)	(0.21)
Immediate * Sued	-0.072**	-0.115**	-0.032	-0.041	-0.085	-0.002	-0.265	-0.388	-0.220
	(0.03)	(0.05)	(0.04)	(0.04)	(0.06)	(0.05)	(0.18)	(0.28)	(0.24)
Post * Sued	-0.044	-0.116*	0.035	0.005	-0.085	0.102	-0.430**	-0.371	-0.485*
	(0.05)	(0.07)	(0.06)	(0.05)	(0.07)	(0.07)	(0.20)	(0.30)	(0.28)
Size	0.476***	0.457***	0.488***	0.461***	0.434***	0.476***	0.510***	0.508***	0.512***
	(0.00)	(0.00)	(0.00)	(0.00)	(0.01)	(0.00)	(0.01)	(0.01)	(0.01)
Leverage	0.262***	0.234***	0.275***	0.246***	0.193***	0.288***	0.296***	0.346***	0.243***
	(0.03)	(0.05)	(0.04)	(0.03)	(0.05)	(0.05)	(0.06)	(0.09)	(0.07)

ROA	0.084***	0.191***	0.000	0.160***	0.222***	0.099***	-0.076**	0.089	-0.154***
	(0.02)	(0.04)	(0.03)	(0.03)	(0.04)	(0.04)	(0.04)	(0.07)	(0.04)
Return	-0.009*	-0.008	-0.012**	-0.011**	-0.009	-0.016**	0.000	-0.006	0.003
	(0.00)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.02)	(0.01)
B/M	0.001**	-0.009***	0.001***	0.001***	-0.012***	0.001***	-0.003***	-0.006***	-0.001
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Tangibles	-0.054**	-0.110***	-0.033	-0.165***	-0.186***	-0.174***	0.175***	0.027	0.268***
	(0.02)	(0.04)	(0.03)	(0.03)	(0.05)	(0.04)	(0.04)	(0.06)	(0.05)
R&D	0.432***	0.495***	0.364***	0.566***	0.526***	0.541***	0.136	0.425***	-0.020
	(0.05)	(0.08)	(0.06)	(0.06)	(0.10)	(0.07)	(0.09)	(0.14)	(0.11)
Dividends	-0.501***	-0.595**	-0.351	-0.102	-0.213	0.100	-0.968***	-1.233**	-0.788**
	(0.18)	(0.30)	(0.22)	(0.22)	(0.34)	(0.29)	(0.28)	(0.60)	(0.31)
H-Index	-1.475***	-1.797***	-1.158***	-1.635***	-2.143***	-1.214***	-1.446***	-1.872***	-1.076***
	(0.15)	(0.23)	(0.19)	(0.18)	(0.29)	(0.23)	(0.25)	(0.40)	(0.32)
H-Index^2	1.577***	1.970***	1.200***	1.845***	2.534***	1.290***	1.301***	1.644***	0.981***
	(0.16)	(0.25)	(0.20)	(0.20)	(0.31)	(0.26)	(0.26)	(0.41)	(0.33)
High-Tech	-0.009	-0.096***	0.060**	-0.032	-0.117***	0.040	-0.005	-0.178***	0.111**
	(0.02)	(0.03)	(0.03)	(0.03)	(0.04)	(0.03)	(0.04)	(0.06)	(0.05)
Intercept	-1.757***	-1.562***	-1.863***	-1.634***	-1.372***	-1.762***	-1.944***	-1.750***	-2.096***
	(0.05)	(0.09)	(0.07)	(0.06)	(0.10)	(0.08)	(0.10)	(0.16)	(0.13)
Firm Fixed Effect	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year Fixed Effect	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
R^2	0.62	0.59	0.65	0.61	0.57	0.64	0.65	0.63	0.67
N	18,395	8,220	10,131	13,953	6,303	7,607	4,442	1,917	2,524

Appendix D.6: Impact of the Filing of a Class Action on Innovative Efficiency (Patents)

Appendix D.6 reports regression estimates for the effect the filing of a class action has on innovative efficiency of patenting. The dependent variable in this regression is the log of one plus *IE Patents*. The regressions were estimated for a sample of sued and propensity score matching sample of non-sued firms. Innovative efficiency was analysed for a window of up to five years before and after the filing of a SCA. The first three columns (*All*) presents results obtained for regressions estimated on all sued and matched firms. Columns four to six (*Patent Pre-Filing*) reports regression estimates for the sample of sued firms that obtained at least one patent in the three years before the filing and the corresponding matched firm. The last three columns (*No-Patent Pre-Filing*) reports regression estimates for the sample of sued firms that did not obtain a patent in the three years before the filing and the corresponding matched firms. The first column in each grouping (*All-Sued*) reports regressions estimated for sued and non-sued firm in that category. The *Dismissed* and *Settled* columns report regressions for those cases that were dismissed and settled. Robust standard errors clustered at the firm level are reported in parentheses. Variables definitions can be found in Table 4.1. *, **, *** Statistically different from zero at the 10, 5 and 1 percent significance levels, respectively.

	Dependent Variable: IE Patents								
	All			Patent Pre-Filing			No-Patent Pre-Filing		
	All-Sued	Dismissed	Settled	All-Sued	Dismissed	Settled	All-Sued	Dismissed	Settled
Immediate	-0.009**	-0.008	-0.011*	-0.021***	-0.027***	-0.018**	0.011	0.022	0.000
	(0.00)	(0.01)	(0.01)	(0.00)	(0.01)	(0.01)	(0.01)	(0.02)	(0.01)
Post	-0.007	-0.003	-0.012	-0.018***	-0.026***	-0.013	0.014	0.045**	-0.018
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.02)	(0.02)
Sued	0.011*	0.010	0.012	0.012**	0.016**	0.010	0.017	-0.029	0.065
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.05)	(0.07)	(0.08)
Immediate * Sued	0.009	0.005	0.012	0.015	0.013	0.015	-0.075	-0.096	-0.093
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.07)	(0.11)	(0.09)
Post * Sued	0.011	-0.003	0.021	0.008	0.004	0.010	-0.024	-0.073	-0.009
	(0.01)	(0.02)	(0.02)	(0.01)	(0.02)	(0.02)	(0.08)	(0.12)	(0.11)
Size	-0.027***	-0.023***	-0.031***	-0.022***	-0.016***	-0.027***	-0.038***	-0.039***	-0.039***
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Leverage	0.001	-0.003	0.008	-0.024**	-0.026**	-0.020	0.083***	0.094***	0.080***
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.02)	(0.03)	(0.03)

ROA	0.046***	0.045***	0.049***	0.037***	0.034***	0.040***	0.062***	0.071***	0.059***
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.02)	(0.02)
Return	0.008***	0.006***	0.009***	0.007***	0.006***	0.009***	0.008**	0.005	0.011**
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.01)	(0.01)
B/M	0.000***	-0.001**	0.000***	0.000***	-0.002***	0.000***	-0.001**	-0.001**	-0.001
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Tangibles	0.081***	0.117***	0.055***	0.113***	0.122***	0.101***	0.013	0.099***	-0.041**
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.02)	(0.02)	(0.02)
Dividends	0.390***	-0.161*	0.723***	0.080	-0.206**	0.311***	0.925***	-0.108	1.227***
	(0.05)	(0.08)	(0.07)	(0.06)	(0.08)	(0.09)	(0.11)	(0.23)	(0.12)
H-Index	0.413***	0.495***	0.387***	0.414***	0.503***	0.397***	0.400***	0.731***	0.218*
	(0.04)	(0.06)	(0.06)	(0.05)	(0.07)	(0.07)	(0.10)	(0.16)	(0.13)
H-Index^2	-0.350***	-0.460***	-0.290***	-0.324***	-0.517***	-0.212***	-0.381***	-0.618***	-0.260**
	(0.05)	(0.07)	(0.07)	(0.05)	(0.07)	(0.08)	(0.10)	(0.16)	(0.13)
High-Tech	-0.007	0.006	-0.008	0.018***	0.025***	0.024**	-0.075***	-0.014	-0.109***
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.02)	(0.02)
Intercept	0.205***	0.148***	0.244***	0.163***	0.104***	0.198***	0.310***	0.211***	0.392***
	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.03)	(0.04)	(0.06)	(0.05)
Firm Fixed Effect	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year Fixed Effect	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
R^2	0.10	0.10	0.11	0.09	0.09	0.10	0.14	0.14	0.17
N	18,452	8,222	10,186	14,009	6,308	7,658	4,443	1,914	2,528

Appendix D.7: Impact of the Filing of a Class Action on Innovative Efficiency (Citations (Fixed))

Appendix D.7 reports regression estimates for the effect the filing of a class action has on innovative efficiency of the citations received on patents. The dependent variable in this regression is the log of one plus *IE Citations (Fixed)*. The regressions were estimated for a sample of sued and propensity score matching sample of non-sued firms. Innovative efficiency was analysed for a window of up to five years before and after the filing of a SCA. The first three columns (*All*) presents results obtained for regressions estimated on all sued and matched firms. Columns four to six (*Patent Pre-Filing*) reports regression estimates for the sample of sued firms that obtained at least one patent in the three years before the filing and the corresponding matched firm. The last three columns (*No-Patent Pre-Filing*) reports regression estimates for the sample of sued firms that did not obtain a patent in the three years before the filing and the corresponding matched firms. The first column in each grouping (*All-Sued*) reports regressions estimated for sued and non-sued firm in that category. The *Dismissed* and *Settled* columns report regressions for those cases that were dismissed and settled. Robust standard errors clustered at the firm level are reported in parentheses. Variables definitions can be found in Table 4.1. *, **, *** Statistically different from zero at the 10, 5 and 1 percent significance levels, respectively.

	Dependent Variable: IE Citations (Fixed)								
	All			Patent Pre-Filing			No-Patent Pre-Filing		
	All-Sued	Dismissed	Settled	All-Sued	Dismissed	Settled	All-Sued	Dismissed	Settled
Immediate	-0.030***	-0.035***	-0.026***	-0.046***	-0.054***	-0.042***	-0.002	-0.014	0.003
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.02)	(0.02)
Post	-0.034***	-0.042***	-0.027**	-0.049***	-0.065***	-0.039**	-0.010	-0.018	-0.007
	(0.01)	(0.01)	(0.01)	(0.01)	(0.02)	(0.02)	(0.02)	(0.03)	(0.02)
Sued	0.040***	0.028*	0.049***	0.052***	0.058***	0.048***	-0.069	-0.178***	0.022
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.04)	(0.06)	(0.06)
Immediate * Sued	0.009	0.007	0.010	0.010	0.001	0.016	-0.099	-0.030	-0.164*
	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.08)	(0.14)	(0.10)
Post * Sued	-0.004	-0.006	-0.008	-0.003	-0.010	-0.002	-0.094	-0.055	-0.147
	(0.02)	(0.03)	(0.03)	(0.02)	(0.03)	(0.03)	(0.08)	(0.14)	(0.10)
Size	-0.026***	-0.022***	-0.029***	-0.019***	-0.011***	-0.025***	-0.041***	-0.047***	-0.039***
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.01)	(0.00)
Leverage	-0.068***	-0.079***	-0.055***	-0.098***	-0.096***	-0.098***	0.026	-0.007	0.056
	(0.01)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.03)	(0.05)	(0.04)

ROA	0.036***	0.039***	0.036***	0.028***	0.027**	0.030**	0.057***	0.071***	0.047***
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.03)	(0.02)
Return	0.021***	0.023***	0.020***	0.020***	0.019***	0.019***	0.027***	0.039***	0.023***
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.01)	(0.01)	(0.01)
B/M	0.000***	-0.002***	0.000**	0.000**	-0.004***	0.000**	-0.001**	-0.002	-0.002**
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Tangibles	0.093***	0.128***	0.073***	0.140***	0.158***	0.124***	0.003	0.069*	-0.027
	(0.01)	(0.02)	(0.01)	(0.01)	(0.02)	(0.02)	(0.02)	(0.04)	(0.03)
Dividends	-0.186*	-0.800***	0.041	-0.609***	-1.350***	-0.424***	0.119	-0.710***	0.462**
	(0.10)	(0.18)	(0.12)	(0.13)	(0.28)	(0.15)	(0.15)	(0.27)	(0.18)
H-Index	0.402***	0.634***	0.291***	0.541***	0.763***	0.456***	0.127	0.706***	-0.209
	(0.07)	(0.11)	(0.09)	(0.08)	(0.12)	(0.11)	(0.14)	(0.23)	(0.17)
H-Index^2	-0.291***	-0.514***	-0.175*	-0.429***	-0.722***	-0.275**	-0.035	-0.472**	0.207
	(0.07)	(0.11)	(0.10)	(0.09)	(0.13)	(0.12)	(0.14)	(0.23)	(0.17)
High-Tech	0.006	0.040**	-0.007	0.049***	0.074***	0.044***	-0.095***	-0.007	-0.146***
	(0.01)	(0.02)	(0.01)	(0.01)	(0.02)	(0.02)	(0.02)	(0.03)	(0.03)
Intercept	0.336***	0.271***	0.375***	0.263***	0.156***	0.324***	0.501***	0.461***	0.529***
	(0.02)	(0.03)	(0.03)	(0.03)	(0.04)	(0.04)	(0.05)	(0.08)	(0.06)
Firm Fixed Effect	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year Fixed Effect	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
R^2	0.05	0.05	0.05	0.05	0.05	0.05	0.08	0.09	0.09
N	23,156	9,922	13,189	17,109	7,463	9,602	6,047	2,459	3,587

Appendix D.8: Impact of the Filing of a Class Action on Innovative Efficiency (Citations (Quasi))

Appendix D.8 reports regression estimates for the effect the filing of a class action has on innovative efficiency of the citations received on patents. The dependent variable in this regression is the log of one plus *IE Citations (Quasi)*. The regressions were estimated for a sample of sued and propensity score matching sample of non-sued firms. Innovative efficiency was analysed for a window of up to five years before and after the filing of a SCA. The first three columns (*All*) presents results obtained for regressions estimated on all sued and matched firms. Columns four to six (*Patent Pre-Filing*) reports regression estimates for the sample of sued firms that obtained at least one patent in the three years before the filing and the corresponding matched firm. The last three columns (*No-Patent Pre-Filing*) reports regression estimates for the sample of sued firms that did not obtain a patent in the three years before the filing and the corresponding matched firms. The first column in each grouping (*All-Sued*) reports regressions estimated for sued and non-sued firm in that category. The *Dismissed* and *Settled* columns report regressions for those cases that were dismissed and settled. Robust standard errors clustered at the firm level are reported in parentheses. Variables definitions can be found in Table 4.1. *, **, *** Statistically different from zero at the 10, 5 and 1 percent significance levels, respectively.

	Dependent Variable: IE Citations (Quasi)								
	All			Patent Pre-Filing			No-Patent Pre-Filing		
	All-Sued	Dismissed	Settled	All-Sued	Dismissed	Settled	All-Sued	Dismissed	Settled
Immediate	-0.052***	-0.063**	-0.043	-0.078***	-0.091***	-0.072**	-0.024	-0.062	-0.009
	(0.02)	(0.03)	(0.03)	(0.02)	(0.03)	(0.03)	(0.04)	(0.06)	(0.05)
Post	-0.037	-0.031	-0.036	-0.053*	-0.068	-0.045	-0.032	-0.008	-0.060
	(0.03)	(0.04)	(0.04)	(0.03)	(0.05)	(0.04)	(0.05)	(0.08)	(0.07)
Sued	0.146***	0.114***	0.164***	0.190***	0.205***	0.176***	-0.390***	-0.657***	-0.167
	(0.03)	(0.04)	(0.04)	(0.03)	(0.04)	(0.04)	(0.11)	(0.16)	(0.16)
Immediate * Sued	0.051	0.063	0.036	0.043	0.027	0.052	-0.330	-0.151	-0.503*
	(0.04)	(0.07)	(0.06)	(0.05)	(0.07)	(0.06)	(0.21)	(0.35)	(0.27)
Post * Sued	-0.010	-0.015	-0.025	-0.017	-0.045	-0.010	-0.137	0.009	-0.292
	(0.06)	(0.09)	(0.08)	(0.06)	(0.09)	(0.09)	(0.21)	(0.37)	(0.26)
Size	-0.044***	-0.024***	-0.064***	-0.026***	0.007	-0.049***	-0.097***	-0.093***	-0.108***
	(0.00)	(0.01)	(0.01)	(0.00)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
Leverage	-0.401***	-0.429***	-0.365***	-0.488***	-0.493***	-0.475***	-0.132*	-0.156	-0.079
	(0.04)	(0.06)	(0.05)	(0.04)	(0.06)	(0.06)	(0.08)	(0.13)	(0.10)

ROA	0.134***	0.139***	0.139***	0.103***	0.094***	0.117***	0.226***	0.294***	0.192***
	(0.02)	(0.03)	(0.03)	(0.02)	(0.03)	(0.03)	(0.04)	(0.07)	(0.05)
Return	0.062***	0.063***	0.061***	0.057***	0.056***	0.055***	0.083***	0.091***	0.082***
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.03)	(0.02)
B/M	0.000	-0.005**	0.000	0.000	-0.016***	0.000	-0.003*	0.000	-0.005**
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Tangibles	0.331***	0.385***	0.294***	0.473***	0.463***	0.470***	0.068	0.265***	-0.042
	(0.03)	(0.05)	(0.04)	(0.04)	(0.06)	(0.05)	(0.06)	(0.09)	(0.07)
Dividends	-1.113***	-2.547***	-0.579*	-2.454***	-4.915***	-1.810***	-0.138	-1.722**	0.497
	(0.27)	(0.51)	(0.32)	(0.38)	(0.84)	(0.43)	(0.40)	(0.69)	(0.49)
H-Index	2.154***	3.196***	1.596***	2.793***	3.768***	2.352***	0.678*	2.560***	-0.505
	(0.19)	(0.30)	(0.26)	(0.23)	(0.35)	(0.31)	(0.36)	(0.59)	(0.46)
H-Index^2	-1.865***	-2.813***	-1.330***	-2.476***	-3.529***	-1.935***	-0.527	-2.072***	0.467
	(0.21)	(0.32)	(0.28)	(0.26)	(0.39)	(0.35)	(0.37)	(0.59)	(0.48)
High-Tech	0.212***	0.372***	0.139***	0.336***	0.475***	0.285***	-0.102*	0.192**	-0.273***
	(0.03)	(0.04)	(0.04)	(0.03)	(0.05)	(0.04)	(0.05)	(0.09)	(0.07)
Intercept	0.859***	0.497***	1.098***	0.589***	0.153	0.855***	1.574***	1.179***	1.847***
	(0.07)	(0.10)	(0.09)	(0.08)	(0.12)	(0.11)	(0.13)	(0.20)	(0.17)
Firm Fixed Effect	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year Fixed Effect	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
R^2	0.12	0.12	0.12	0.12	0.13	0.12	0.14	0.15	0.15
N	23,156	9,922	13,189	17,109	7,463	9,602	6,047	2,459	3,587

Appendix E:

Chapter 2: Dropping Financial Firms and Utilities

This appendix presents the results from Chapter 2 after excluding firms in the financial sector (SIC codes 6000 to 6799) and utilities (SIC codes 4900 to 4949). Results from the tests of Hypothesis 1, that firms borrowing from a reputable lender will be less likely to have a SCA filed against them, are reported in Appendix E.1 and E.2, which are comparable to the results presented in Tables 2.5 and 2.6. The results reported in Appendix E.1 are equivalent in sign and significance as those reported in Table 2.5. The reputable (Amount) measure is now marginally significant when estimating the regressions from equation (2.3) (see Appendix E.2). This would suggest that, contrary to Hypothesis 1, firms that borrow from reputable lenders are more likely to be sued. However, since this result is only marginally significant for one of the measures of reputation this finding should be interpreted with caution.

Appendix E.3 reports the estimated models given in equation (2.4), which test Hypothesis 2a and 2b. These results are equivalent to those reported in Table 2.7. The overall significance of the primary variable of interest (*Pre-Rel * Post Filing*) remains unchanged after excluding financial firms and utilities, which suggests that the results are not being driven by differences in these industries.

Finally the results testing Hypothesis 3 are reported in Appendices E.4 to E.11. This hypothesis tested that, after the filing of a SCA, firms that had a relationship with a lender

will receive more favourable loan terms than firms without a relationship. The results in Appendices E.4 to E.11 are equivalent to the results presented in Tables 2.8 to 2.15. Overall, the results reported in this appendix and in Chapter 2 are quantitatively similar. One difference to note is the interaction term (*Pre-Rel * Post Filing*) is positive and significant when Loan Size is the dependent variable in Table 2.8, whereas the interaction term is insignificant after excluding financials and utilities (see Appendix E.4). Although the interaction term was only marginally significant in the original model, the findings reported in Appendix E.4 suggest that the significance when Loan Size was the dependent variable may have been driven by industry differences. Despite the slight differences in significance between the original results and those reported in this appendix, excluding financials and utilities does not materially impact the results and interpretation presented in Chapter 2.

Appendix E.1: Impact of Risk of Class Action on Bank Reputation – No Financials or Utilities

Appendix E.1 reports two stage analysis for the effect of litigation risk on the probability of a loan being obtained from a reputable lender, using equations (2.1) and (2.2). The dependent variable in the first stage (*Sued*) takes a value of one if a class action was filed in a particular year and is equal to zero otherwise. The dependent variable in the second stage is equal to one if a loan is obtained from a reputable lender and is equal to zero otherwise. For *Reputable (Amount)* a lender is deemed to be reputable if the market share based on the amount of money lent exceeds 3%. For *Reputable (Number)* a lender is deemed to be reputable if the market share based on the number of loans provided exceeds 3%. Robust standard errors clustered at the firm level are reported in parentheses. Variable definitions can be found in Table 2.1. *, **, *** Statistically different from zero at the 10, 5 and 1 percent significance levels, respectively.

	First Stage	Second Stage			
	SCA Dummy	Reputable (Amount)		Reputable (Number)	
SCA Dummy		-6.609***	-3.186***	-5.562***	-2.843***
		(0.96)	(1.07)	(0.97)	(1.06)
Size	0.294***	0.359***	0.116***	0.275***	0.068***
	(0.02)	(0.01)	(0.02)	(0.01)	(0.02)
Leverage	0.368**	0.674***	0.219**	0.375***	0.012
	(0.16)	(0.08)	(0.09)	(0.08)	(0.09)
ROA	-0.124**	0.380***	0.264*	0.314**	0.185
	(0.06)	(0.14)	(0.15)	(0.13)	(0.14)
B/M	-0.021*	0.004***	0.001**	0.002***	0.001*
	(0.01)	(0.00)	(0.00)	(0.00)	(0.00)
Tangibles	-1.349***	-0.269***	-0.241***	-0.23***	-0.2***
	(0.15)	(0.06)	(0.06)	(0.05)	(0.06)
Dividends	-2.119	1.696***	1.252***	1.791***	1.393***
	(1.49)	(0.51)	(0.48)	(0.54)	(0.53)
Loan Size			0.460***		0.390***
			(0.01)		(0.01)
Loan Maturity			0.000		-0.069***
			(0.02)		(0.02)
Intercept	-5.662***	-1.586***	-8.478***	-1.443***	-7.074***
	(0.30)	(0.15)	(0.28)	(0.14)	(0.27)
Year Fixed Effect	Yes	Yes	Yes	Yes	Yes
Industry Fixed Effect	Yes	Yes	Yes	Yes	Yes
R^2	0.023	0.1019	0.1533	0.0603	0.1003
N	43841	20619	19209	20619	19209

Appendix E.2: Impact of Bank Reputation on Probability of Class Action – No Financials or Utilities

Appendix E.2 reports logit regression estimates for the effect the reputation of banks have on the probability of a firm being sued, using equation (2.3). The dependent variable in these regressions takes the value of one if a class action was filed in a particular year and is equal to zero otherwise. Robust standard errors clustered at the firm level are reported in parentheses. Variable definitions can be found in Table 2.1. *, **, *** Statistically different from zero at the 10, 5 and 1 percent significance levels, respectively.

	Dependant Variable: Sued	
Reputable (Amount)	0.166*	
	(0.10)	
Reputable (Number)		0.076
		(0.08)
Size	0.290***	0.283***
	(0.02)	(0.02)
Leverage	0.083	0.060
	(0.14)	(0.14)
ROA	-0.044	-0.052
	(0.06)	(0.06)
Return	-0.028*	-0.027*
	(0.02)	(0.02)
B/M	-0.006**	-0.006**
	(0.00)	(0.00)
Tangibles	-1.324***	-1.324***
	(0.14)	(0.14)
Dividends	-1.248	-1.276
	(1.30)	(1.31)
Intercept	-5.635	-5.546
	(8.02)	(8.03)
Year Dummies	Yes	Yes
Industry Dummies	Yes	Yes
R^2	0.0222	0.0221
N	33631	33631

Appendix E.3: Impact of Class Action on Relationship with Bank – No Financials or Utilities

Appendix E.3 reports logit regression estimates for the effect the filing of a class action has on whether a loan is obtained from a lender that the firm has a relationship with, using equation (2.4). The dependent variable in these regressions takes the value of one if the loan was obtained from a lender that the firm has previously borrowed from and is equal to zero otherwise. Robust standard errors clustered at the firm level are reported in parentheses. Variable definitions can be found in Table 2.1. *, **, *** Statistically different from zero at the 10, 5 and 1 percent significance levels, respectively.

	Dependant Variable: Relationship with Lender					
	All		Dismissed		Settled	
Post Filing	-0.153	-0.364	-0.107	0.657	-0.197	-1.482**
	(0.12)	(0.34)	(0.18)	(0.49)	(0.19)	(0.59)
Pre-Rel		1.058***		1.741***		0.718**
		(0.21)		(0.34)		(0.32)
Pre-Rel * Post Filing		0.123		-0.945*		1.247**
		(0.35)		(0.51)		(0.60)
Size	0.072**	0.049	0.077	0.049	0.071	0.041
	(0.03)	(0.03)	(0.05)	(0.05)	(0.05)	(0.05)
Leverage	-0.213	-0.278	-0.488	-0.669	-0.504	-0.551
	(0.31)	(0.31)	(0.49)	(0.50)	(0.48)	(0.49)
ROA	-0.237	-0.212	0.911	1.167	-0.439	-0.426
	(0.35)	(0.35)	(0.81)	(0.82)	(0.59)	(0.60)
B/M	0.002	0.007	-0.016	-0.033	0.002	0.003
	(0.02)	(0.02)	(0.05)	(0.05)	(0.02)	(0.02)
Tangibles	0.106	0.114	-0.484	-0.454	0.641*	0.614*
	(0.22)	(0.22)	(0.33)	(0.34)	(0.34)	(0.35)
Dividends	19.74***	17.481***	29.988***	29.011***	-0.166	-3.586
	(6.17)	(6.04)	(9.18)	(8.93)	(10.11)	(10.24)
Term Spread	-0.909	-0.915	-0.450	-0.486	-4.859	-5.150
	(20.64)	(20.64)	(22.57)	(23.02)	(12.09)	(10.95)
Credit Spread	7.764	8.115	-3.696	-2.795	124.000	132.100
	(49.44)	(49.44)	(54.12)	(55.18)	(362.20)	(327.70)
Intercept	-2.737	-3.671	8.081	6.123	-113.300	-121.200
	(25.56)	(25.27)	(25.10)	(24.77)	(341.30)	(308.80)
Industry Fixed Effect	Yes	Yes	Yes	Yes	Yes	Yes
R^2	0.0682	0.0812	0.1090	0.1279	0.1062	0.1176
N	2738	2738	1320	1320	1418	1418

Appendix E.4: Summary of Results When Class Action is Settled – No Financials or Utilities

Appendix E.4 presents a summary of the results of the impact a SCA have on loan characteristics. The dependent variables are one of seven loan characteristics, using equation (2.5). These loan characteristics include loan: spread, size, maturity, collateral, number of covenants, syndicate size and percentage held by the lead arranger. The results reported are for the class actions that were settled. Robust standard errors clustered at the firm level are reported in parentheses. Variable definitions can be found in Table 2.1. *, **, *** Statistically different from zero at the 10, 5 and 1 percent significance levels, respectively.

	Reduced Model		Diff-in-Diff Model				
Dependent Variable	Expected PostFiling	PostFiling	Expected PostFiling	PostFiling	PreRel	Expected PreRel*PostFiling	PreRel*PostFiling
Loan Spread	+	0.289***	+	0.916***	0.033	+	-0.646***
		(0.04)		(0.17)	(0.07)		(0.17)
Loan Size	-	-0.006	-	0.066	0.326***	-	-0.113
		(0.07)		(0.23)	(0.12)		(0.24)
Loan Maturity	-	-0.112***	-	-0.209	0.166*	-	0.080
		(0.04)		(0.17)	(0.10)		(0.17)
Loan Collateral	+	0.254	+	-0.139	-0.779	+	0.468
		(0.33)		(0.92)	(0.14)		(0.74)
Loan Covenants	+	-0.002	+	-0.175	0.044	+	0.171
		(0.98)		(0.51)	(0.69)		(0.53)
Syndicate Size	-	-0.163***	-	-0.098	0.200**	-	-0.091
		(0.00)		(0.64)	(0.04)		(0.67)
Lead Allocation	+	0.013	+	-0.060	-0.007	+	0.075
		(0.56)		(0.60)	(0.87)		(0.52)

Appendix E.5: Impact a Relationship with a Bank has on Loan Spread – No Financials or Utilities

Appendix E.5 reports OLS regression estimates for the effect the filing of a class action has on loan spread, using equation (2.5). The dependent variable in these regressions is the natural log of the all-in drawn spread. Robust standard errors clustered at the firm level are reported in parentheses. Variable definitions can be found in Table 2.1. *, **, *** Statistically different from zero at the 10, 5 and 1 percent significance levels, respectively.

	Loan Spread					
	All		Dismissed		Settled	
Post Filing	0.201***	0.337***	0.127***	-0.018	0.289***	0.916***
	(0.03)	(0.10)	(0.04)	(0.10)	(0.04)	(0.17)
Pre-Rel		0.017		0.017		0.033
		(0.05)		(0.08)		(0.07)
Pre-Rel * Post Filing		-0.144		0.153		-0.646***
		(0.11)		(0.11)		(0.17)
Size	-0.299***	-0.299***	-0.318***	-0.320***	-0.253***	-0.25***
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
Leverage	0.956***	0.961***	0.815***	0.811***	0.969***	0.99***
	(0.09)	(0.09)	(0.13)	(0.13)	(0.10)	(0.10)
ROA	0.165*	0.164*	-0.700***	-0.673***	0.275***	0.283***
	(0.10)	(0.10)	(0.26)	(0.26)	(0.08)	(0.08)
B/M	-0.049***	-0.049***	-0.093***	-0.093***	-0.043***	-0.042***
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
Tangibles	-0.272***	-0.273***	-0.046	-0.045	-0.335***	-0.334***
	(0.06)	(0.06)	(0.09)	(0.09)	(0.07)	(0.07)
Dividends	-4.974***	-4.958**	-3.440**	-3.457**	-14.211***	-14.287***
	(1.92)	(1.92)	(1.52)	(1.52)	(1.54)	(1.52)
Term Spread	0.465*	0.483*	0.888***	0.864***	-0.410	-0.350
	(0.25)	(0.25)	(0.27)	(0.27)	(0.46)	(0.42)
Credit Spread	1.596*	1.612*	2.524***	2.440***	1.863	1.003
	(0.88)	(0.88)	(0.91)	(0.91)	(1.62)	(1.58)
Intercept	4.803***	4.717***	3.255**	3.398**	5.729**	6.388**
	(1.39)	(1.39)	(1.45)	(1.45)	(2.55)	(2.53)
Industry Fixed Effect	Yes	Yes	Yes	Yes	Yes	Yes
Year Fixed Effect	Yes	Yes	Yes	Yes	Yes	Yes
R^2	0.6162	0.6165	0.6632	0.6639	0.6451	0.6503
N	2315	2315	1077	1077	1238	1238

Appendix E.6: Impact a Relationship with a Bank has on Loan Size – No Financials or Utilities

Appendix E.6 reports OLS regression estimates for the effect the filing of a class action has on loan size, using equation (2.5). The dependent variable in these regressions is the natural log of the size of the loan. Robust standard errors clustered at the firm level are reported in parentheses. Variable definitions can be found in Table 2.1. *, **, *** Statistically different from zero at the 10, 5 and 1 percent significance levels, respectively.

	Loan Size					
	All		Dismissed		Settled	
Post Filing	0.026	0.055	0.006	-0.027	-0.006	0.066
	(0.05)	(0.14)	(0.07)	(0.19)	(0.07)	(0.23)
Pre-Rel		0.261***		0.235*		0.326***
		(0.09)		(0.13)		(0.12)
Pre-Rel * Post Filing		-0.051		0.026		-0.113
		(0.14)		(0.19)		(0.24)
Size	0.494***	0.489***	0.459***	0.454***	0.494***	0.487***
	(0.01)	(0.01)	(0.02)	(0.02)	(0.02)	(0.02)
Leverage	0.496***	0.494***	0.574***	0.565***	0.620***	0.638***
	(0.13)	(0.13)	(0.20)	(0.20)	(0.19)	(0.19)
ROA	-0.397***	-0.396***	-0.641**	-0.586*	-0.238	-0.240
	(0.14)	(0.14)	(0.32)	(0.32)	(0.16)	(0.16)
B/M	0.071***	0.072***	0.067***	0.064***	0.064***	0.066***
	(0.01)	(0.01)	(0.02)	(0.02)	(0.01)	(0.01)
Tangibles	0.268***	0.267***	0.231*	0.233*	0.153	0.143
	(0.09)	(0.09)	(0.13)	(0.13)	(0.12)	(0.12)
Dividends	0.142	0.058	-0.490	-0.508	0.988	0.467
	(0.72)	(0.72)	(0.71)	(0.71)	(2.98)	(2.98)
Term Spread	0.918**	0.905**	0.263	0.249	2.594***	2.561***
	(0.38)	(0.38)	(0.45)	(0.44)	(0.69)	(0.70)
Credit Spread	2.729*	2.724*	1.075	1.013	5.342*	5.511**
	(1.43)	(1.42)	(1.62)	(1.62)	(2.77)	(2.78)
Intercept	10.465***	10.351***	14.106***	14.067***	3.647	3.364
	(2.22)	(2.21)	(2.57)	(2.56)	(4.24)	(4.21)
Industry Fixed Effect	Yes	Yes	Yes	Yes	Yes	Yes
Year Fixed Effect	Yes	Yes	Yes	Yes	Yes	Yes
R^2	0.4444	0.4462	0.4863	0.4879	0.4477	0.4502
N	2736	2736	1319	1319	1417	1417

Appendix E.7: Impact a Relationship with a Bank has on Loan Maturity – No Financials or Utilities

Appendix E.7 reports OLS regression estimates for the effect the filing of a class action has on loan maturity, using equation (2.5). The dependent variable in these regressions is the natural log of the number of months until maturity of the loan. Robust standard errors clustered at the firm level are reported in parentheses. Variable definitions can be found in Table 2.1. *, **, *** Statistically different from zero at the 10, 5 and 1 percent significance levels, respectively.

	Loan Maturity					
	All		Dismissed		Settled	
Post Filing	-0.077***	-0.076	-0.033	-0.009	-0.112***	-0.209
	(0.03)	(0.10)	(0.04)	(0.12)	(0.04)	(0.17)
Pre-Rel		0.118*		0.047		0.166*
		(0.07)		(0.09)		(0.10)
Pre-Rel * Post Filing		-0.010		-0.027		0.080
		(0.10)		(0.13)		(0.17)
Size	-0.116***	-0.119***	-0.122***	-0.123***	-0.112***	-0.117***
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
Leverage	0.361***	0.360***	0.393***	0.391***	0.433***	0.439***
	(0.08)	(0.08)	(0.13)	(0.13)	(0.11)	(0.11)
ROA	0.371***	0.37***	0.67***	0.673***	0.305***	0.302***
	(0.07)	(0.07)	(0.21)	(0.21)	(0.08)	(0.08)
B/M	-0.011*	-0.011*	-0.009	-0.009	-0.010	-0.010
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
Tangibles	0.019	0.018	-0.015	-0.014	0.013	0.006
	(0.06)	(0.06)	(0.09)	(0.09)	(0.07)	(0.07)
Dividends	-1.010	-1.037	-1.080	-1.079	1.575	1.342
	(0.64)	(0.64)	(0.75)	(0.76)	(2.10)	(2.10)
Term Spread	-0.362**	-0.369**	-0.279	-0.278	-0.309	-0.342
	(0.17)	(0.17)	(0.20)	(0.20)	(0.33)	(0.35)
Credit Spread	-2.083***	-2.083***	-2.009**	-2.010**	-2.845**	-2.587**
	(0.65)	(0.65)	(0.81)	(0.82)	(1.16)	(1.22)
Intercept	8.031***	7.981***	7.980***	7.949***	8.319***	8.049***
	(1.04)	(1.04)	(1.28)	(1.29)	(1.83)	(1.85)
Industry Fixed Effect	Yes	Yes	Yes	Yes	Yes	Yes
Year Fixed Effect	Yes	Yes	Yes	Yes	Yes	Yes
R^2	0.2255	0.2269	0.2865	0.2866	0.226	0.2293
N	2584	2584	1266	1266	1318	1318

Appendix E.8: Impact a Relationship with a Bank has on Loan Collateral – No Financials or Utilities

Appendix E.8 reports logit regression estimates for the effect the filing of a class action has on loan collateral, using equation (2.5). The dependent variable in these regressions takes the value of one if the loan requires collateral and is equal to zero otherwise. Robust standard errors clustered at the firm level are reported in parentheses. Variable definitions can be found in Table 2.1. *, **, *** Statistically different from zero at the 10, 5 and 1 percent significance levels, respectively.

	Loan Collateral					
	All		Dismissed		Settled	
Post Filing	0.270	-0.147	0.333	0.323	0.254	-0.139
	(0.11)	(0.81)	(0.19)	(0.72)	(0.33)	(0.92)
Pre-Rel		-0.279		0.966		-0.779
		(0.42)		(0.10)		(0.14)
Pre-Rel * Post Filing		0.453		-0.011		0.468
		(0.48)		(0.99)		(0.74)
Size	-0.973***	-0.972***	-0.996***	-1.020***	-1.027***	-1.024***
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Leverage	2.930***	2.943***	2.258***	2.176***	3.765***	3.809***
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
ROA	-0.541	-0.503	0.914	0.661	-1.242	-1.253
	(0.54)	(0.57)	(0.54)	(0.66)	(0.34)	(0.35)
B/M	-0.131***	-0.133***	-0.096	-0.128	-0.166***	-0.183***
	(0.01)	(0.01)	(0.43)	(0.28)	(0.00)	(0.00)
Tangibles	-0.601*	-0.602*	0.594	0.563	-1.196**	-1.170**
	(0.06)	(0.06)	(0.24)	(0.26)	(0.01)	(0.02)
Dividends	-25.589***	-25.626***	-26.956**	-23.813**	-41.448**	-37.199**
	(0.00)	(0.00)	(0.01)	(0.02)	(0.01)	(0.03)
Term Spread	0.616	0.601	1.962	2.089	-8.375	-8.403
	(0.59)	(0.60)	(0.16)	(0.14)	(0.95)	(0.95)
Credit Spread	-1.693	-1.777	-2.276	-2.053	15.496	15.36
	(0.69)	(0.68)	(0.67)	(0.70)	(0.96)	(0.96)
Intercept	8.643	9.008	6.172	4.974	12.970	13.767
	(0.78)	(0.77)	(0.82)	(0.85)	(0.71)	(0.69)
Industry Fixed Effect	Yes	Yes	Yes	Yes	Yes	Yes
Year Fixed Effect	Yes	Yes	Yes	Yes	Yes	Yes
Pseudo R^2	0.4178	0.4181	0.4495	0.4526	0.4541	0.4555
N	1678	1678	782	782	896	896

Appendix E.9: Impact a Relationship with a Bank has on Loan Covenants – No Financials or Utilities

Appendix E.9 reports poisson regression estimates for the effect the filing of a class action has on loan covenants, using equation (2.5). The dependent variable in these regressions is the number of covenants in the loan contract. Robust standard errors clustered at the firm level are reported in parentheses. Variable definitions can be found in Table 2.1. *, **, *** Statistically different from zero at the 10, 5 and 1 percent significance levels, respectively.

	Number of Covenants					
	All		Dismissed		Settled	
Post Filing	-0.001	-0.002	-0.019	0.071	-0.002	-0.175
	(0.99)	(0.99)	(0.75)	(0.70)	(0.98)	(0.51)
Pre-Rel		0.086		0.170		0.044
		(0.26)		(0.13)		(0.69)
Pre-Rel * Post Filing		-0.010		-0.114		0.171
		(0.95)		(0.56)		(0.53)
Size	-0.122***	-0.124***	-0.134***	-0.136***	-0.097***	-0.099***
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Leverage	0.208**	0.206**	0.205	0.192	0.257*	0.249*
	(0.04)	(0.05)	(0.23)	(0.26)	(0.09)	(0.10)
ROA	0.020	0.014	0.011	-0.009	0.029	0.020
	(0.82)	(0.88)	(0.97)	(0.98)	(0.78)	(0.85)
B/M	-0.049***	-0.048***	-0.043	-0.043	-0.058***	-0.058***
	(0.00)	(0.00)	(0.23)	(0.22)	(0.00)	(0.00)
Tangibles	-0.189***	-0.191***	-0.114	-0.105	-0.218**	-0.226**
	(0.01)	(0.01)	(0.33)	(0.37)	(0.03)	(0.03)
Dividends	-1.489	-1.489	-0.955	-0.928	-6.898*	-6.954*
	(0.16)	(0.16)	(0.38)	(0.39)	(0.05)	(0.05)
Term Spread	0.333	0.336	0.469	0.498	0.326	0.314
	(0.32)	(0.32)	(0.26)	(0.23)	(0.62)	(0.63)
Credit Spread	-0.011	0.011	-0.053	-0.016	1.284	1.555
	(0.99)	(0.99)	(0.97)	(0.99)	(0.66)	(0.60)
Intercept	0.969	0.902	0.825	0.631	-0.786	-1.020
	(0.64)	(0.66)	(0.73)	(0.79)	(0.86)	(0.82)
Industry Fixed Effect	Yes	Yes	Yes	Yes	Yes	Yes
Year Fixed Effect	Yes	Yes	Yes	Yes	Yes	Yes
Pseudo R^2	0.3885	0.3918	0.5247	0.5312	0.3616	0.3683
N	1420	1420	656	656	764	764

Appendix E.10: Impact a Relationship with a Bank has on Syndicate Size – No Financials or Utilities

Appendix E.10 reports negative binomial regression estimates for the effect the filing of a class action has on syndicate size, using equation (2.5). The dependent variable in these regressions is the number of participants in the loan syndicate. Robust standard errors clustered at the firm level are reported in parentheses. Variable definitions can be found in Table 2.1. *, **, *** Statistically different from zero at the 10, 5 and 1 percent significance levels, respectively.

	Syndicate Size					
	All		Dismissed		Settled	
Post Filing	-0.077**	-0.114	0.048	-0.081	-0.163***	-0.098
	(0.04)	(0.40)	(0.35)	(0.66)	(0.00)	(0.64)
Pre-Rel		0.155**		0.060		0.200**
		(0.04)		(0.61)		(0.04)
Pre-Rel * Post Filing		0.027		0.134		-0.091
		(0.85)		(0.48)		(0.67)
Size	0.226***	0.222***	0.200***	0.197***	0.236***	0.231***
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Leverage	0.361***	0.362***	0.171	0.171	0.553***	0.564***
	(0.00)	(0.00)	(0.26)	(0.26)	(0.00)	(0.00)
ROA	-0.242**	-0.242**	-0.123	-0.100	-0.213*	-0.214*
	(0.02)	(0.02)	(0.67)	(0.72)	(0.07)	(0.07)
B/M	0.022***	0.022***	0.012	0.011	0.020***	0.021***
	(0.00)	(0.00)	(0.37)	(0.44)	(0.00)	(0.00)
Tangibles	0.158**	0.156**	-0.050	-0.051	0.097	0.091
	(0.02)	(0.02)	(0.64)	(0.63)	(0.30)	(0.33)
Dividends	0.431	0.354	0.438	0.420	-1.250	-1.733
	(0.57)	(0.64)	(0.60)	(0.61)	(0.56)	(0.42)
Term Spread	0.534**	0.524*	0.433	0.412	1.055**	1.058**
	(0.05)	(0.05)	(0.17)	(0.19)	(0.05)	(0.05)
Credit Spread	2.591**	2.592**	2.935**	2.883**	1.324	1.477
	(0.01)	(0.01)	(0.02)	(0.02)	(0.52)	(0.47)
Intercept	-3.917**	-3.988**	-3.935**	-3.855**	-3.767	-4.067
	(0.02)	(0.02)	(0.04)	(0.05)	(0.23)	(0.19)
Industry Fixed Effect	Yes	Yes	Yes	Yes	Yes	Yes
Year Fixed Effect	Yes	Yes	Yes	Yes	Yes	Yes
Pseudo R^2	0.12	0.12	0.13	0.13	0.16	0.17
N	2738	2738	1320	1320	1418	1418

Appendix E.11: Impact a Relationship with a Bank has on Lead Allocation – No Financials or Utilities

Appendix E.11 reports Tobit regression estimates for the effect the filing of a class action has on lead allocation, using equation (2.5). The dependent variable in these regressions is the percentage of the loan retained by the lead arranger. Robust standard errors clustered at the firm level are reported in parentheses. Variable definitions can be found in Table 2.1. *, **, *** Statistically different from zero at the 10, 5 and 1 percent significance levels, respectively.

	Lead Allocation					
	All		Dismissed		Settled	
Post Filing	0.025	0.077	0.037	0.208**	0.013	-0.060
	(0.13)	(0.30)	(0.13)	(0.03)	(0.56)	(0.60)
Pre-Rel		0.004		0.016		-0.007
		(0.91)		(0.76)		(0.87)
Pre-Rel * Post Filing		-0.053		-0.180*		0.075
		(0.48)		(0.07)		(0.52)
Size	-0.055***	-0.055***	-0.072***	-0.071***	-0.044***	-0.044***
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Leverage	0.094**	0.095**	0.088	0.092	0.101	0.099
	(0.05)	(0.05)	(0.26)	(0.24)	(0.10)	(0.11)
ROA	0.030	0.029	-0.075	-0.087	0.049	0.052
	(0.58)	(0.59)	(0.49)	(0.43)	(0.40)	(0.38)
B/M	-0.010***	-0.010***	-0.032***	-0.032***	-0.011***	-0.011***
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Tangibles	-0.096***	-0.097***	-0.041	-0.042	-0.057	-0.053
	(0.00)	(0.00)	(0.48)	(0.46)	(0.13)	(0.16)
Dividends	-0.250	-0.250	0.434	0.404	-0.143	-0.238
	(0.50)	(0.50)	(0.32)	(0.35)	(0.90)	(0.84)
Term Spread	-0.033	-0.024	0.010	0.019	-0.493***	-0.514***
	(0.76)	(0.82)	(0.94)	(0.89)	(0.01)	(0.01)
Credit Spread	-0.343	-0.331	-0.320	-0.217	-1.637*	-1.536*
	(0.47)	(0.49)	(0.57)	(0.70)	(0.06)	(0.08)
Intercept	1.219*	1.184	1.177	1.019	3.701***	3.650***
	(0.10)	(0.11)	(0.18)	(0.25)	(0.01)	(0.01)
Industry Fixed Effect	Yes	Yes	Yes	Yes	Yes	Yes
Year Fixed Effect	Yes	Yes	Yes	Yes	Yes	Yes
Pseudo R^2	0.22	0.22	0.30	0.30	0.31	0.31
N	824	824	387	387	437	437

Appendix F:

Chapter 3: Dropping Financial Firms and Utilities

This appendix presents the results from Chapter 3 after excluding firms in the financial sector (SIC codes 6000 to 6799) and utilities (SIC codes 4900 to 4949). The results reported in Appendices F.1 to F.4 are equivalent to the results presented in Tables 3.7 to 3.10.

Overall, the results reported in this appendix are quantitatively similar to the findings presented in Chapter 3. The one key difference to note is the Pre-SOX models when the dependent variable is the settled dummy variable (Table 3.8 and Appendix F.2). In Table 3.8 the Lobby Dummy and Amount variables are significantly negatively related to whether the case was settled in the Pre-SOX models. However, the two lobby variables are insignificant after excluding financials and utilities. It should be noted that this finding was only marginally significant in Table 3.8, but the lack of significance for the two lobby measures in Appendix F.2 suggest that industry differences could in part be driving the results. Overall, however, dropping financial firms and utilities from the analysis does not materially impact the results or the interpretation reported in Chapter 3.

Appendix F.1: Regressions with Days in Class Period as the Dependent Variable – No Financials or Utilities

Appendix F.1 reports OLS regression estimates for the effect the lobbying has on the number of days in the class period, using equation (3.1). The dependent variable in these regressions is the natural log of the number of days in the class period. The first two columns present the regressions estimated for the pre-SOX period, from 2000 to 2004. The last two columns present the regressions estimated for the post-SOX period, from 2005 to 2012. Standard errors are reported in parentheses. Variables definitions can be found in Table 3.1. *, **, *** Statistically different from zero at the 10, 5 and 1 percent significance levels, respectively.

	Dependent Variable: Log of Days in Class Period			
	Pre-SOX - 2000 to 2004		Post-SOX - 2005 to 2012	
	(1)	(2)	(3)	(4)
Lobby Dummy	0.28***		0.00	
	(0.10)		(0.12)	
Lobby Amount		0.02***		0.00
		(0.01)		(0.01)
Settled	0.08	0.08	0.27***	0.27***
	(0.08)	(0.08)	(0.10)	(0.10)
Provable Loss	-0.13**	-0.13**	0.02	0.02
	(0.06)	(0.06)	(0.04)	(0.04)
Days to File	0.01	0.01	0.05*	0.05*
	(0.02)	(0.02)	(0.03)	(0.03)
Size	-0.05**	-0.05**	-0.07**	-0.07**
	(0.02)	(0.02)	(0.03)	(0.04)
Leverage	0.09	0.10	-0.13	-0.13
	(0.16)	(0.16)	(0.21)	(0.21)
ROA	-0.02	-0.02	0.16	0.16
	(0.08)	(0.08)	(0.23)	(0.23)
B/M	0.06	0.06	0.01	0.01
	(0.03)	(0.04)	(0.05)	(0.05)
Intercept	5.67***	5.68***	5.81***	5.83***
	(0.19)	(0.20)	(0.27)	(0.28)
R^2	0.05	0.04	0.05	0.05
N	604	604	376	376

Appendix F.2: Regressions with Settled Dummy as the Dependent Variable – No Financials or Utilities

Appendix F.2 reports logit regression estimates for the effect the lobbying has on the whether the class action was settled, using equation (3.2). The dependent variable in these regressions takes the value of one if the class action is settled and is equal to zero if it is dismissed. The first two columns present the regressions estimated for the pre-SOX period, from 2000 to 2004. The last two columns present the regressions estimated for the post-SOX period, from 2005 to 2012. Standard errors are reported in parentheses. Variables definitions can be found in Table 3.1. *, **, *** Statistically different from zero at the 10, 5 and 1 percent significance levels, respectively.

	Dependent Variable: Settled Dummy Variable			
	Pre-SOX - 2000 to 2004		Post-SOX - 2005 to 2012	
	(1)	(2)	(3)	(4)
Lobby Dummy	-0.35		-0.33	
	(0.26)		(0.25)	
Lobby Amount		-0.03		-0.02
		(0.02)		(0.02)
Provable Loss	-0.68***	-0.68***	-0.07	-0.07
	(0.18)	(0.18)	(0.09)	(0.09)
Days in CP	0.11	0.10	0.31***	0.31***
	(0.11)	(0.11)	(0.12)	(0.12)
Days to File	0.12**	0.12**	-0.12*	-0.12*
	(0.05)	(0.05)	(0.06)	(0.06)
Size	-0.10	-0.10	-0.14*	-0.15*
	(0.06)	(0.07)	(0.08)	(0.08)
Leverage	-0.03	-0.03	0.53	0.52
	(0.46)	(0.46)	(0.46)	(0.46)
ROA	-0.01	-0.01	0.91*	0.92*
	(0.23)	(0.23)	(0.52)	(0.52)
B/M	0.09	0.10	-0.12	-0.12
	(0.13)	(0.13)	(0.12)	(0.12)
Intercept	0.41	0.38	-0.34	-0.31
	(0.82)	(0.83)	(0.89)	(0.90)
Pseudo R^2	0.11	0.11	0.08	0.08
N	604	604	376	376

Appendix F.3: Regressions with Provable Loss as the Dependent Variable – No Financials or Utilities

Appendix F.3 reports OLS regression estimates for the effect the lobbying has on the size of the provable loss, using equation (3.3). The dependent variable in these regressions is the percentage change in the firm's market capitalization from the beginning of the class period to the end of the class period. The first two columns present the regressions estimated for the pre-SOX period, from 2000 to 2004. The last two columns present the regressions estimated for the post-SOX period, from 2005 to 2012. Standard errors are reported in parentheses. Variables definitions can be found in Table 3.1. *, **, *** Statistically different from zero at the 10, 5 and 1 percent significance levels, respectively.

	Dependent Variable: Provable Loss			
	Pre-SOX - 2000 to 2004		Post-SOX - 2005 to 2012	
	(1)	(2)	(3)	(4)
Lobby Dummy	0.03		-0.09	
	(0.06)		(0.15)	
Lobby Amount		0.00		-0.01
		(0.00)		(0.01)
Settled	-0.21***	-0.21***	-0.11	-0.11
	(0.05)	(0.05)	(0.13)	(0.13)
Days in CP	-0.05**	-0.05**	0.03	0.03
	(0.03)	(0.03)	(0.07)	(0.07)
Days to File	-0.02	-0.02	-0.02	-0.02
	(0.01)	(0.01)	(0.04)	(0.04)
Size	0.01	0.01	-0.06	-0.06
	(0.01)	(0.01)	(0.05)	(0.05)
Leverage	0.03	0.03	-0.04	-0.05
	(0.10)	(0.10)	(0.28)	(0.28)
ROA	0.18***	0.17***	0.16	0.16
	(0.05)	(0.05)	(0.31)	(0.31)
B/M	-0.07***	-0.07***	0.04	0.04
	(0.02)	(0.02)	(0.06)	(0.06)
Intercept	0.11	0.10	0.30	0.29
	(0.19)	(0.19)	(0.54)	(0.55)
R^2	0.12	0.12	0.01	0.01
N	604	604	376	376

Appendix F.4: Regressions with Settlement Size as the Dependent Variable – No Financials or Utilities

Appendix F.4 reports OLS regression estimates for the effect the lobbying has on the size of the settlement, using equation (3.4). The dependent variable in these is the natural log of the cash settlement. Only those class actions that were settled with available data on cash settlement are used in these regressions. The first two columns present the regressions estimated for the pre-SOX period, from 2000 to 2004. The last two columns present the regressions estimated for the post-SOX period, from 2005 to 2012. Standard errors are reported in parentheses. Variables definitions can be found in Table 3.1. *, **, *** Statistically different from zero at the 10, 5 and 1 percent significance levels, respectively.

	Dependent Variable: Log of Cash Settlement			
	Pre-SOX - 2000 to 2004		Post-SOX - 2005 to 2012	
	(1)	(2)	(3)	(4)
Lobby Dummy	0.03		0.07	
	(0.23)		(0.16)	
Lobby Amount		0.01		0.01
		(0.02)		(0.01)
Provable Loss	-0.25	-0.27	0.00	0.00
	(0.17)	(0.17)	(0.05)	(0.05)
Days in CP	0.16*	0.15*	0.26***	0.26***
	(0.09)	(0.09)	(0.07)	(0.07)
Days to File	-0.05	-0.05	-0.02	-0.02
	(0.05)	(0.05)	(0.04)	(0.04)
Size	0.5***	0.48***	0.47***	0.46***
	(0.06)	(0.06)	(0.05)	(0.05)
Leverage	0.26	0.24	0.38	0.38
	(0.40)	(0.40)	(0.30)	(0.30)
ROA	-0.74***	-0.73***	-0.49	-0.48
	(0.26)	(0.26)	(0.37)	(0.37)
B/M	0.41**	0.41**	0.02	0.02
	(0.16)	(0.16)	(0.06)	(0.06)
Intercept	11.52***	11.61***	11.34***	11.36***
	(0.69)	(0.70)	(0.57)	(0.58)
R^2	0.38	0.38	0.47	0.47
N	219	219	170	170

Appendix G:

Chapter 4: Accounting for Missing R&D

This appendix presents robustness tests for Chapter 4. The results reported in this appendix replace any missing R&D value for firms that have received at least one patent with the industry average R&D. This robustness test is used to combat the issue that just over 10% of firms with missing R&D receive patents (Koh and Reeb, 2015). In the tests of Hypotheses 2 and 3 from Chapter 4, it was required that firms be involved in innovative activity, categorised based on whether a firm had R&D expenditures. Based on Koh and Reeb's (2015) findings this approach is likely overlooking some innovative firms. This is a particular issue for the innovative efficiency measures, which require prior years R&D expenses.[69]

For the results reported in this appendix the industry average R&D is multiplied by the ratio of a firm's sales to the industry average sales, as in equation (G.1).

$$\mathrm{R\&D_{i,t}} = \mathrm{Ave}\left(\mathrm{R\&D_{Ind,t}}\right) * \mathrm{Sales_{i,t}}/Ave(Sales_{Ind,t}) \quad \text{(G.1)}$$

This adjusted R&D measure is used in place of any missing R&D data.

Results for tests of Hypothesis 2, which predicts that among innovating firms those firms that are struggling to innovate are more likely to commit misconduct, are presented in Appendices G.1 and G.2. These tables are equivalent to Tables 4.7 and 4.8. The results from these robustness are quantitatively similar to those presented in Chapter 4, which suggests that firms with missing R&D data are unlikely to be driving the results.

[69] See section 4.3.1.3 for an overview of how these measures are calculated.

Hypothesis 3 in Chapter 4 predicts that innovative efficiency will improve post-filing. The re-estimated regressions to test this hypothesis, using the adjusted measure of R&D in place of missing R&D data, are reported in Appendices G.3 to G.10, which are equivalent to Tables 4.10 to 4.17. The coefficients and significance are quantitatively similar between the results presented in this appendix and those reported in Chapter 4. As such, innovating firms with missing R&D data do not appear to be driving the findings from Chapter 4.

Appendix G.1: Probability of Being Sued by Amount of Innovation

Appendix G.1 reports logit regression estimates for the probability of a firm being sued, using equation (4.4). The dependent variable in these regressions is a dummy variable equal to one if the firm is sued in year *t*. The eight innovation measures (*R&D/Assets*, *Patents*, *Citations (Fixed)*, *Citations (Quasi)*, *Value Added*, *IE Patents*, *IE Citations (Fixed)* and *IE Citations (Quasi)*) are calculated based on the level of innovative activity being undertaken in the preceding three years. Robust standard errors clustered at the firm level are reported in parentheses. Variables definitions can be found in Table 4.1. *, **, *** Statistically different from zero at the 10, 5 and 1 percent significance levels, respectively.

	Dependant Variable: SCA Dummy							
$R\&D/Assets_{i\ t-1,t-3}$	-0.210**							
	(0.09)							
$Patents_{i\ t-1,t-3}$		-0.077***						
		(0.02)						
$Citations\ (Fixed)_{i\ t-1,t-3}$			0.097					
			(0.07)					
$Citations\ (Quasi)_{i\ t-1,t-3}$				0.024				
				(0.02)				
$Value\ Added_{i\ t-1,t-3}$					-0.192***			
					(0.04)			
$IE\ Patents_{i\ t-1,t-3}$						0.106		
						(0.08)		
$IE\ Citations\ (Fixed)_{i\ t-1,t-3}$							0.051	
							(0.06)	
$IE\ Citations\ (Quasi)_{i\ t-1,t-3}$								0.032
								(0.03)
Size	0.331***	0.379***	0.327***	0.327***	0.428***	0.300***	0.322***	0.321***
	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)
Leverage	-0.011	-0.004	0.010	0.006	0.017	0.021	0.242	0.242
	(0.16)	(0.16)	(0.16)	(0.16)	(0.16)	(0.20)	(0.19)	(0.19)

ROA	-0.250***	-0.225***	-0.205***	-0.206***	-0.221***	-0.213***	-0.192***	-0.192***
	(0.05)	(0.05)	(0.05)	(0.05)	(0.05)	(0.07)	(0.07)	(0.07)
Return	-0.030***	-0.032***	-0.032***	-0.032***	-0.031***	-0.046**	-0.066	-0.067
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.02)	(0.04)	(0.04)
B/M	-0.001	-0.001	-0.001	-0.001	-0.001	-0.002	-0.002	-0.002
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Tangibles	-1.800***	-1.734***	-1.806***	-1.813***	-1.756***	-1.740***	-1.432***	-1.430***
	(0.16)	(0.16)	(0.16)	(0.16)	(0.16)	(0.20)	(0.20)	(0.20)
Dividends	-2.285	-2.061	-1.911	-1.956	-2.182	-3.235	-6.049*	-6.033*
	(1.66)	(1.60)	(1.60)	(1.61)	(1.63)	(2.61)	(3.17)	(3.17)
Std Ret	0.018*	0.019*	0.019*	0.019*	0.021*	0.023	0.034**	0.034**
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.02)	(0.01)	(0.01)
Beta	0.003**	0.003**	0.003**	0.003**	0.003**	0.001	0.001	0.001
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Skew	-0.161***	-0.160***	-0.160***	-0.160***	-0.160***	-0.169***	-0.176***	-0.177***
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.02)	(0.02)	(0.02)
Intercept	-5.895	-6.160	-5.956	-5.957	-6.365	-6.394	-7.349	-7.390
	(15.03)	(14.94)	(15.09)	(15.06)	(15.07)	(47.94)	(54.15)	(54.23)
Industry Fixed Effect	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year Fixed Effect	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Pseudo R^2	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04
N	34192	34192	34192	34188	34192	21221	21353	21350

Appendix G.2: Probability of Being Sued by Amount of Innovation Relative to the Industry

Appendix G.2 reports logit regression estimates for the probability of a firm being sued, using equation (4.4). The dependent variable in these regressions is a dummy variable equal to one if the firm is sued in year *t*. The eight innovation measures (*R&D/Assets*, *Patents*, *Citations (Fixed)*, *Citations (Quasi)*, *Value Added*, *IE Patents*, *IE Citations (Fixed)* and *IE Citations (Quasi)*) are calculated as the level of innovative activity being undertaken in the preceding three years by firm *i* less the industry average level of innovative activity in the preceding three years. Robust standard errors clustered at the firm level are reported in parentheses. Variables definitions can be found in Table 4.1. *, **, *** Statistically different from zero at the 10, 5 and 1 percent significance levels, respectively.

	Dependant Variable: SCA Dummy							
$R\&D/Assets_{i\ t-1,t-3}$ - $R\&D/Assets_{ind\ t-1,t-3}$	-0.154*							
	(0.09)							
$Patents_{i\ t-1,t-3}$ - $Patents_{ind\ t-1,t-3}$		-0.070***						
		(0.02)						
$Citations\ (Fixed)_{i\ t-1,t-3}$ - $Citations\ (Fixed)_{ind\ t-1,t-3}$			0.107*					
			(0.07)					
$Citations\ (Quasi)_{i\ t-1,t-3}$ - $Citations\ (Quasi)_{ind\ t-1,t-3}$				0.030				
				(0.02)				
$Value\ Added_{i\ t-1,t-3}$ - $Value\ Added_{ind\ t-1,t-3}$					-0.180***			
					(0.04)			
$IE\ Patents_{i\ t-1,t-3}$ - $IE\ Patents_{ind\ t-1,t-3}$						0.124		
						(0.08)		
$IE\ Citations\ (Fixed)_{i\ t-1,t-3}$ - $IE\ Citations\ (Fixed)_{ind\ t-1,t-3}$							0.055	
							(0.06)	
$IE\ Citations\ (Quasi)_{i\ t-1,t-3}$ - $IE\ Citations\ (Quasi)_{ind\ t-1,t-3}$								0.031
								(0.03)
Size	0.332***	0.375***	0.326***	0.325***	0.422***	0.301***	0.322***	0.321***
	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)
Leverage	-0.007	-0.003	0.011	0.008	0.016	0.024	0.243	0.243
	(0.16)	(0.16)	(0.16)	(0.16)	(0.16)	(0.20)	(0.19)	(0.19)

ROA	-0.240***	-0.223***	-0.205***	-0.206***	-0.220***	-0.213***	-0.192***	-0.192***
	(0.05)	(0.05)	(0.05)	(0.05)	(0.05)	(0.07)	(0.07)	(0.07)
Return	-0.031***	-0.032***	-0.032***	-0.032***	-0.031***	-0.046**	-0.067	-0.066
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.02)	(0.04)	(0.04)
B/M	-0.001	-0.001	-0.001	-0.001	-0.001	-0.002	-0.002	-0.002
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Tangibles	-1.802***	-1.739***	-1.806***	-1.814***	-1.760***	-1.740***	-1.432***	-1.431***
	(0.16)	(0.16)	(0.16)	(0.16)	(0.16)	(0.20)	(0.20)	(0.20)
Dividends	-2.224	-2.072	-1.892	-1.924	-2.184	-3.245	-6.040*	-6.040*
	(1.65)	(1.60)	(1.59)	(1.60)	(1.63)	(2.61)	(3.18)	(3.17)
Std Ret	0.018*	0.019*	0.019*	0.019*	0.020*	0.023	0.034**	0.034**
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.02)	(0.01)	(0.01)
Beta	0.003**	0.003**	0.003**	0.003**	0.003**	0.001	0.001	0.001
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Skew	-0.161***	-0.160***	-0.160***	-0.160***	-0.160***	-0.169***	-0.176***	-0.177***
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.02)	(0.02)	(0.02)
Intercept	-5.938	-6.204	-5.932	-5.928	-6.432	-6.342	-7.308	-7.302
	(15.03)	(14.95)	(15.10)	(15.08)	(15.04)	(47.87)	(54.07)	(54.04)
Industry Fixed Effect	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year Fixed Effect	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Pseudo R^2	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04
N	34192	34192	34192	34188	34192	21221	21353	21350

Appendix G.3: Impact of a Filing on R&D – Settled Cases

Appendix G.3 reports OLS regression estimates for the effect the filing of a class action that was settled has on R&D expenditures. The dependent variable in this regression is the ratio of R&D/Assets. The regressions were estimated for a sample of sued and propensity score matching sample of non-sued firms. R&D was analysed for a window of up to five years before and after the filing of a SCA. The first column (*All*) presents results obtained for regressions estimated on all sued and matched firms. The second column (*Patent Pre-Filing*) reports regression estimates for the sample of sued firms that obtained at least one patent in the three years before the filing and the corresponding matched firm. The second column (*No-Patent Pre-Filing*) reports regression estimates for the sample of sued firms that did not obtain a patent in the three years before the filing and the corresponding matched firms. Robust standard errors clustered at the firm level are reported in parentheses. Variables definitions can be found in Table 4.1. *, **, *** Statistically different from zero at the 10, 5 and 1 percent significance levels, respectively.

	Dependant Variable: R&D/Assets		
	All	Inn Pre-Filing	No-Inn Pre-Filing
Immediate	0.002	0.000	0.006
	(0.00)	(0.00)	(0.00)
Post	-0.005	-0.011	0.007
	(0.00)	(0.01)	(0.01)
Sued	0.010**	0.024***	-0.019***
	(0.00)	(0.01)	(0.01)
Immediate * Sued	-0.025***	-0.028***	-0.015
	(0.01)	(0.01)	(0.01)
Post * Sued	-0.010	-0.008	-0.017
	(0.01)	(0.01)	(0.01)
Size	-0.007***	-0.008***	-0.008***
	(0.00)	(0.00)	(0.00)
Leverage	-0.055***	-0.040***	-0.079***
	(0.01)	(0.01)	(0.01)
ROA	-0.166***	-0.168***	-0.160***
	(0.00)	(0.01)	(0.00)
Return	-0.001	-0.001	-0.001
	(0.00)	(0.00)	(0.00)
B/M	0.000	0.000	-0.001**
	(0.00)	(0.00)	(0.00)
Tangibles	-0.012***	-0.029***	0.006
	(0.00)	(0.01)	(0.01)
Dividends	0.016	0.021	0.015
	(0.03)	(0.05)	(0.04)
H-Index	-0.035	-0.132***	0.056*
	(0.03)	(0.05)	(0.03)
H-Index^2	0.024	0.111**	-0.060*
	(0.03)	(0.05)	(0.03)
High-Tech	0.085***	0.062***	0.103***
	(0.00)	(0.01)	(0.00)
Intercept	0.164***	0.228***	0.099***
	(0.01)	(0.02)	(0.01)
Firm Fixed Effect	Yes	Yes	Yes
Year Fixed Effect	Yes	Yes	Yes
R^2	0.20	0.15	0.31
N	22183	13007	9176

Appendix G.4: Impact of a Filing on the Number of Patents – Settled Cases

Appendix G.4 reports OLS regression estimates for the effect the filing of a class action that was settled has on the number of patents. The dependent variable in this regression is the log of one plus the number of patents. The regressions were estimated for a sample of sued and propensity score matching sample of non-sued firms. The number of patents were analysed for a window of up to five years before and after the filing of a SCA. The first column (*All*) presents results obtained for regressions estimated on all sued and matched firms. The second column (*Patent Pre-Filing*) reports regression estimates for the sample of sued firms that obtained at least one patent in the three years before the filing and the corresponding matched firm. The second column (*No-Patent Pre-Filing*) reports regression estimates for the sample of sued firms that did not obtain a patent in the three years before the filing and the corresponding matched firms. Robust standard errors clustered at the firm level are reported in parentheses. Variables definitions can be found in Table 4.1. *, **, *** Statistically different from zero at the 10, 5 and 1 percent significance levels, respectively.

	Dependant Variable: Patents		
	All	Inn Pre-Filing	No-Inn Pre-Filing
Immediate	-0.062***	-0.033	-0.132***
	(0.02)	(0.03)	(0.03)
Post	-0.012	0.079*	-0.190***
	(0.03)	(0.05)	(0.04)
Sued	0.031	0.229***	-0.562***
	(0.03)	(0.04)	(0.04)
Immediate * Sued	-0.001	-0.022	0.157**
	(0.05)	(0.07)	(0.06)
Post * Sued	0.001	-0.189**	0.267***
	(0.07)	(0.09)	(0.09)
Size	0.435***	0.515***	0.229***
	(0.00)	(0.01)	(0.01)
Leverage	0.236***	0.178***	0.189***
	(0.04)	(0.06)	(0.05)
ROA	0.101***	0.126***	0.039
	(0.03)	(0.04)	(0.03)
Return	-0.083***	-0.084***	-0.052***
	(0.01)	(0.01)	(0.01)
B/M	0.006***	0.006***	0.015***
	(0.00)	(0.00)	(0.00)
Tangibles	0.577***	1.131***	0.159***
	(0.03)	(0.05)	(0.04)
R&D	0.843***	0.957***	0.496***
	(0.07)	(0.10)	(0.08)
Dividends	0.978***	0.632*	0.431*
	(0.24)	(0.37)	(0.26)
H-Index	3.696***	4.200***	1.624***
	(0.20)	(0.32)	(0.22)
H-Index^2	-3.133***	-3.291***	-1.325***
	(0.22)	(0.36)	(0.23)
High-Tech	0.915***	0.853***	0.588***
	(0.03)	(0.04)	(0.03)
Intercept	-3.521***	-4.238***	-1.559***
	(0.07)	(0.10)	(0.08)
Firm Fixed Effect	Yes	Yes	Yes
Year Fixed Effect	Yes	Yes	Yes
R^2	0.34	0.39	0.22
N	22419	13136	9283

Appendix G.5: Impact of a Filing on the Number of Citations (Fixed) – Settled Cases

Appendix G.5 reports OLS regression estimates for the effect the filing of a class action that was settled has on the number of citations. The dependent variable in this regression is the log of one plus the number of citations per patent scaled by the average number of citations received by patents granted in the same year and in the same technology subcategory. The regressions were estimated for a sample of sued and propensity score matching sample of non-sued firms. The number of citations were analysed for a window of up to five years before and after the filing of a SCA. The first column (*All*) presents results obtained for regressions estimated on all sued and matched firms. The second column (*Patent Pre-Filing*) reports regression estimates for the sample of sued firms that obtained at least one patent in the three years before the filing and the corresponding matched firm. The second column (*No-Patent Pre-Filing*) reports regression estimates for the sample of sued firms that did not obtain a patent in the three years before the filing and the corresponding matched firms. Robust standard errors clustered at the firm level are reported in parentheses. Variables definitions can be found in Table 4.1. *, **, *** Statistically different from zero at the 10, 5 and 1 percent significance levels, respectively.

	Dependant Variable: Citations (Fixed)		
	All	Inn Pre-Filing	No-Inn Pre-Filing
Immediate	-0.032***	-0.037***	-0.022**
	(0.01)	(0.01)	(0.01)
Post	-0.042***	-0.036**	-0.042***
	(0.01)	(0.02)	(0.02)
Sued	0.028**	0.136***	-0.220***
	(0.01)	(0.02)	(0.02)
Immediate * Sued	0.007	-0.004	0.073***
	(0.02)	(0.02)	(0.03)
Post * Sued	0.029	-0.025	0.129***
	(0.02)	(0.03)	(0.04)
Size	0.073***	0.069***	0.058***
	(0.00)	(0.00)	(0.00)
Leverage	-0.027*	-0.060***	0.008
	(0.02)	(0.02)	(0.02)
ROA	0.023**	0.009	0.018
	(0.01)	(0.01)	(0.01)
Return	-0.004	-0.001	-0.005
	(0.00)	(0.00)	(0.00)
B/M	0.001***	0.000***	0.001**
	(0.00)	(0.00)	(0.00)
Tangibles	0.022*	0.043**	-0.002
	(0.01)	(0.02)	(0.01)
R&D	0.232***	0.200***	0.176***
	(0.02)	(0.03)	(0.03)
Dividends	-0.176**	-0.381***	-0.047
	(0.08)	(0.12)	(0.11)
H-Index	0.391***	0.201*	0.228***
	(0.07)	(0.11)	(0.09)
H-Index^2	-0.287***	-0.046	-0.168*
	(0.08)	(0.12)	(0.09)
High-Tech	0.220***	0.151***	0.201***
	(0.01)	(0.01)	(0.01)
Intercept	-0.471***	-0.380***	-0.345***
	(0.02)	(0.04)	(0.03)
Firm Fixed Effect	Yes	Yes	Yes
Year Fixed Effect	Yes	Yes	Yes
R^2	0.14	0.12	0.14
N	22419	13136	9283

Appendix G.6: Impact of a Filing on the Number of Citations (Quasi) – Settled Cases

Appendix G.6 reports OLS regression estimates for the effect the filing of a class action that was settled has on the number of citations. The dependent variable in this regression is the log of one plus the number of citations per patent multiplied by an adjustment factor obtained from the citation lag distribution. The regressions were estimated for a sample of sued and propensity score matching sample of non-sued firms. The number of citations were analysed for a window of up to five years before and after the filing of a SCA. The first column (*All*) presents results obtained for regressions estimated on all sued and matched firms. The second column (*Patent Pre-Filing*) reports regression estimates for the sample of sued firms that obtained at least one patent in the three years before the filing and the corresponding matched firm. The second column (*No-Patent Pre-Filing*) reports regression estimates for the sample of sued firms that did not obtain a patent in the three years before the filing and the corresponding matched firms. Robust standard errors clustered at the firm level are reported in parentheses. Variables definitions can be found in Table 4.1. *, **, *** Statistically different from zero at the 10, 5 and 1 percent significance levels, respectively.

	Dependant Variable: Citations (Quasi)		
	All	Inn Pre-Filing	No-Inn Pre-Filing
Immediate	-0.094***	-0.081**	-0.101***
	(0.03)	(0.03)	(0.04)
Post	-0.119***	-0.066	-0.170***
	(0.04)	(0.05)	(0.05)
Sued	0.153***	0.583***	-0.841***
	(0.04)	(0.05)	(0.06)
Immediate * Sued	-0.025	-0.110	0.308***
	(0.06)	(0.07)	(0.09)
Post * Sued	0.056	-0.200**	0.535***
	(0.08)	(0.10)	(0.12)
Size	0.278***	0.271***	0.206***
	(0.01)	(0.01)	(0.01)
Leverage	-0.101**	-0.183***	-0.022
	(0.05)	(0.06)	(0.07)
ROA	0.113***	0.084*	0.076*
	(0.03)	(0.05)	(0.04)
Return	-0.024***	-0.012	-0.029**
	(0.01)	(0.01)	(0.01)
B/M	0.003***	0.002***	0.006***
	(0.00)	(0.00)	(0.00)
Tangibles	0.259***	0.411***	0.085*
	(0.04)	(0.05)	(0.05)
R&D	0.769***	0.622***	0.584***
	(0.08)	(0.10)	(0.10)
Dividends	-0.149	-0.827**	0.162
	(0.27)	(0.39)	(0.34)
H-Index	2.332***	1.815***	1.254***
	(0.22)	(0.33)	(0.29)
H-Index^2	-1.882***	-1.150***	-0.999***
	(0.24)	(0.38)	(0.30)
High-Tech	0.895***	0.657***	0.744***
	(0.03)	(0.05)	(0.04)
Intercept	-2.139***	-1.930***	-1.367***
	(0.08)	(0.11)	(0.11)
Firm Fixed Effect	Yes	Yes	Yes
Year Fixed Effect	Yes	Yes	Yes
R^2	0.20	0.20	0.16
N	22419	13136	9283

Appendix G.7: Impact of a Filing on the Value Added by Patents – Settled Cases

Appendix G.7 reports OLS regression estimates for the effect the filing of a class action that was settled has on the value added by patents. The dependent variable in this regression is the log of one plus the average value added per patent. The regressions were estimated for a sample of sued and propensity score matching sample of non-sued firms. The value added was analysed for a window of up to five years before and after the filing of a SCA. The first column (*All*) presents results obtained for regressions estimated on all sued and matched firms. The second column (*Patent Pre-Filing*) reports regression estimates for the sample of sued firms that obtained at least one patent in the three years before the filing and the corresponding matched firm. The second column (*No-Patent Pre-Filing*) reports regression estimates for the sample of sued firms that did not obtain a patent in the three years before the filing and the corresponding matched firms. Robust standard errors clustered at the firm level are reported in parentheses. Variables definitions can be found in Table 4.1. *, **, *** Statistically different from zero at the 10, 5 and 1 percent significance levels, respectively.

	Dependant Variable: Value Added		
	All	Inn Pre-Filing	No-Inn Pre-Filing
Immediate	-0.040**	-0.050**	0.002
	(0.02)	(0.02)	(0.03)
Post	-0.082***	-0.099***	-0.029
	(0.03)	(0.03)	(0.05)
Sued	0.076***	0.061**	0.396**
	(0.03)	(0.03)	(0.19)
Immediate * Sued	-0.052	-0.021	-0.297
	(0.04)	(0.05)	(0.22)
Post * Sued	0.007	0.078	-0.564**
	(0.06)	(0.06)	(0.27)
Size	0.494***	0.481***	0.519***
	(0.00)	(0.00)	(0.01)
Leverage	0.278***	0.291***	0.230***
	(0.04)	(0.04)	(0.07)
ROA	-0.002	0.092**	-0.150***
	(0.03)	(0.04)	(0.04)
Return	-0.015**	-0.018***	-0.002
	(0.01)	(0.01)	(0.01)
B/M	0.001***	0.001***	-0.001
	(0.00)	(0.00)	(0.00)
Tangibles	0.009	-0.131***	0.257***
	(0.03)	(0.03)	(0.04)
R&D	0.358***	0.513***	0.011
	(0.06)	(0.07)	(0.11)
Dividends	-0.382*	0.129	-0.838***
	(0.22)	(0.29)	(0.31)
H-Index	-1.516***	-1.677***	-1.051***
	(0.18)	(0.22)	(0.29)
H-Index^2	1.479***	1.701***	0.894***
	(0.19)	(0.25)	(0.31)
High-Tech	0.000	-0.032	0.094**
	(0.02)	(0.03)	(0.04)
Intercept	-1.867***	-1.721***	-2.188***
	(0.07)	(0.08)	(0.12)
Firm Fixed Effect	Yes	Yes	Yes
Year Fixed Effect	Yes	Yes	Yes
R^2	0.66	0.64	0.70
N	10748	8014	2734

Appendix G.8: Impact of a Filing on Innovative Efficiency (Patents) – Settled Cases

Appendix G.8 reports OLS regression estimates for the effect the filing of a class action that was settled has on innovative efficiency of patenting. The dependent variable in this regression is the log of one plus *IE Patents*. The regressions were estimated for a sample of sued and propensity score matching sample of non-sued firms. Innovative efficiency was analysed for a window of up to five years before and after the filing of a SCA. The first column (*All*) presents results obtained for regressions estimated on all sued and matched firms. The second column (*Patent Pre-Filing*) reports regression estimates for the sample of sued firms that obtained at least one patent in the three years before the filing and the corresponding matched firm. The second column (*No-Patent Pre-Filing*) reports regression estimates for the sample of sued firms that did not obtain a patent in the three years before the filing and the corresponding matched firms. Robust standard errors clustered at the firm level are reported in parentheses. Variables definitions can be found in Table 4.1. *, **, *** Statistically different from zero at the 10, 5 and 1 percent significance levels, respectively.

	Dependant Variable: IE (Patents)		
	All	Inn Pre-Filing	No-Inn Pre-Filing
Immediate	0.088	0.187	-0.116
	(0.22)	(0.30)	(0.20)
Post	-0.178	-0.231	-0.027
	(0.31)	(0.42)	(0.29)
Sued	0.812***	0.765**	-0.250
	(0.31)	(0.36)	(1.16)
Immediate * Sued	-1.058**	-1.192**	0.069
	(0.50)	(0.59)	(1.35)
Post * Sued	-0.905	-0.980	0.134
	(0.70)	(0.84)	(1.63)
Size	-0.127***	-0.124**	-0.149***
	(0.05)	(0.06)	(0.05)
Leverage	-0.980**	-1.262**	-0.248
	(0.44)	(0.58)	(0.45)
ROA	0.176	0.151	0.237
	(0.28)	(0.40)	(0.24)
Return	0.045	0.061	-0.005
	(0.07)	(0.09)	(0.09)
B/M	-0.001	-0.001	-0.004
	(0.00)	(0.00)	(0.01)
Tangibles	0.070	0.166	0.163
	(0.32)	(0.45)	(0.28)
Dividends	-1.428	-1.902	-0.326
	(2.56)	(3.75)	(2.01)
H-Index	-5.043**	-8.607***	1.519
	(2.04)	(2.81)	(1.83)
H-Index^2	4.916**	8.747***	-1.647
	(2.23)	(3.14)	(1.92)
High-Tech	-1.324***	-1.777***	-0.384
	(0.28)	(0.38)	(0.27)
Intercept	2.646***	3.347***	1.344*
	(0.78)	(1.03)	(0.78)
Firm Fixed Effect	Yes	Yes	Yes
Year Fixed Effect	Yes	Yes	Yes
R^2	0.01	0.01	0.01
N	10971	8143	2828

Appendix G.9: Impact of a Filing on Innovative Efficiency (Citations (Fixed)) – Settled Cases

Appendix G.9 reports OLS regression estimates for the effect the filing of a class action that was settled has on innovative efficiency of the citations received on patents. The dependent variable in this regression is the log of one plus *IE Citations (Fixed)*. The regressions were estimated for a sample of sued and propensity score matching sample of non-sued firms. Innovative efficiency was analysed for a window of up to five years before and after the filing of a SCA. The first column (*All*) presents results obtained for regressions estimated on all sued and matched firms. The second column (*Patent Pre-Filing*) reports regression estimates for the sample of sued firms that obtained at least one patent in the three years before the filing and the corresponding matched firm. The second column (*No-Patent Pre-Filing*) reports regression estimates for the sample of sued firms that did not obtain a patent in the three years before the filing and the corresponding matched firms. Robust standard errors clustered at the firm level are reported in parentheses. Variables definitions can be found in Table 4.1. *, **, *** Statistically different from zero at the 10, 5 and 1 percent significance levels, respectively.

	Dependant Variable: IE (Citations (Fixed))		
	All	Inn Pre-Filing	No-Inn Pre-Filing
Immediate	0.032	0.133	-0.026
	(0.41)	(0.60)	(0.13)
Post	-0.579	-0.942	0.254
	(0.56)	(0.81)	(0.18)
Sued	0.585	0.407	0.157
	(0.61)	(0.78)	(0.41)
Immediate * Sued	1.163	1.084	-0.527
	(0.93)	(1.18)	(0.64)
Post * Sued	-0.539	-0.465	-0.687
	(1.23)	(1.57)	(0.71)
Size	-0.212**	-0.268**	-0.135***
	(0.08)	(0.12)	(0.03)
Leverage	-1.851**	-2.745**	0.131
	(0.80)	(1.11)	(0.29)
ROA	0.295	0.358	0.187
	(0.44)	(0.65)	(0.14)
Return	0.040	0.039	0.055
	(0.13)	(0.17)	(0.05)
B/M	-0.003	-0.003	-0.005
	(0.01)	(0.01)	(0.01)
Tangibles	0.223	0.562	-0.030
	(0.60)	(0.90)	(0.19)
Dividends	-3.657	-5.484	-0.615
	(4.91)	(8.02)	(1.35)
H-Index	-6.207*	-12.204**	3.521***
	(3.76)	(5.62)	(1.21)
H-Index^2	6.056	11.110*	-1.984
	(4.14)	(6.33)	(1.28)
High-Tech	-2.286***	-3.535***	-0.185
	(0.53)	(0.78)	(0.18)
Intercept	4.285***	6.455***	0.693
	(1.32)	(1.91)	(0.46)
Firm Fixed Effect	Yes	Yes	Yes
Year Fixed Effect	Yes	Yes	Yes
R^2	0.00	0.00	0.03
N	15457	10913	4544

Appendix G.10: Impact of a Filing on Innovative Efficiency (Citations (Quasi)) – Settled Cases

Appendix G.10 reports OLS egression estimates for the effect the filing of a class action that was settled has on innovative efficiency of the citations received on patents. The dependent variable in this regression is the log of one plus *IE Citations (Quasi)*. The regressions were estimated for a sample of sued and propensity score matching sample of non-sued firms. Innovative efficiency was analysed for a window of up to five years before and after the filing of a SCA. The first column (*All*) presents results obtained for regressions estimated on all sued and matched firms. The second column (*Patent Pre-Filing*) reports regression estimates for the sample of sued firms that obtained at least one patent in the three years before the filing and the corresponding matched firm. The second column (*No-Patent Pre-Filing*) reports regression estimates for the sample of sued firms that did not obtain a patent in the three years before the filing and the corresponding matched firms. Robust standard errors clustered at the firm level are reported in parentheses. Variables definitions can be found in Table 4.1. *, **, *** Statistically different from zero at the 10, 5 and 1 percent significance levels, respectively.

	Dependant Variable: IE (Citations (Quasi))		
	All	Inn Pre-Filing	No-Inn Pre-Filing
Immediate	0.540	2.453	-1.212
	(6.65)	(9.40)	(5.54)
Post	-7.067	-12.202	4.610
	(9.00)	(12.64)	(7.58)
Sued	15.069	11.258	28.225*
	(9.88)	(12.14)	(16.73)
Immediate * Sued	23.795	24.270	-36.697
	(14.96)	(18.38)	(26.19)
Post * Sued	-11.014	-8.333	-38.566
	(19.75)	(24.57)	(29.02)
Size	-4.674***	-5.483***	-3.526***
	(1.34)	(1.84)	(1.29)
Leverage	-37.966***	-50.476***	-10.779
	(12.82)	(17.34)	(11.91)
ROA	7.444	7.930	6.553
	(7.12)	(10.19)	(5.80)
Return	1.564	1.400	2.472
	(2.06)	(2.70)	(2.10)
B/M	-0.055	-0.055	-0.163
	(0.09)	(0.10)	(0.26)
Tangibles	5.668	11.004	1.207
	(9.69)	(14.01)	(7.96)
Dividends	-92.026	-117.961	-56.868
	(78.94)	(125.10)	(55.69)
H-Index	-127.753**	-206.628**	2.364
	(60.51)	(87.74)	(49.59)
H-Index^2	122.339*	182.684*	23.340
	(66.51)	(98.71)	(52.48)
High-Tech	-46.118***	-63.549***	-17.233**
	(8.56)	(12.10)	(7.42)
Intercept	84.905***	114.449***	36.713*
	(21.28)	(29.83)	(18.88)
Firm Fixed Effect	Yes	Yes	Yes
Year Fixed Effect	Yes	Yes	Yes
R^2	0.01	0.01	0.02
N	15457	10913	4544